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EFFECT OF WORK ATTITUDES ON PERFORMANCE
WITHIN TAC BASE SUPPLY ORGANIZATIONS

THESIS

Stephen J. Eichenbrenner, B.S.
Captain, USAF

AFIT/GLM/LSR/91S-17

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THESIS

Presented to the Faculty of the School of Systems and
Logistics of the Air Force Institute of Technology
Air University

In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Logistics Management

Stephen J. Eichenbrenner, B.S.

Captain, USAF

September 1991

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Stephen J. Eichenbrenner

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Abstract

The purpose of this study was to evaluate the effect of work attitudes and rewards on the performance of TAC base level Supply personnel. The research used a survey instrument to examine a cross section of all enlisted employees assigned to various positions within TAC Supply.

The research had four major objectives: 1) test three causal hypotheses through path analysis to determine if the research results supported or disconfirmed each of them; 2) determine if individuals functioning in customer service positions are significantly different than those who are not supporting customers; 3) identify opportunities available to Supply managers for improving their organizations; and 4) provide a benchmark for future work attitude evaluations.

Path analysis revealed support for performance as a predictor of satisfaction and commitment, but not vice-versa. Rewards were not found to have much of an affect on performance, but were found to affect satisfaction. Organizational commitment was found to have the greatest influence on performance. The only difference between the two groups of employees lied within their response to intrinsic reward satisfaction for customer service efforts. Recommendations were subsequently offered to Supply managers and suggestions for future research were given.

EFFECT OF WORK ATTITUDES ON PERFORMANCE
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I. Introduction and Literature Review

General Issue

Organizations are becoming increasingly concerned with their employees' work attitudes. Where employees interact with personnel outside of the organization (i.e., customer service functions), their work attitudes can affect customer retention and profits (Sellers, 1990:59). Efforts to better understand work attitudes and their relationship on performance, would be well received by organizations attempting to better adjust to their environment in which they function.

A recent study by Flores (1990) indicated a lack of customer satisfaction with Base Supply Support (Flores, 1990:88). Flores' results suggest Supply's customers are generally not satisfied with the performance of Supply Customer Service Personnel. Many possibilities exist which may explain why these employees perform in the manner in which they do.

As a continuation of Flores' thesis, this research initially evaluates Supply employees' work attitudes, including their job satisfaction and organizational commitment

levels. Next, the reward system is explored to determine which rewards are actually valued and which types of behaviors are presently rewarded within Base Supply. Lastly, an analysis is conducted of how these work attitudes and reward systems affect performance.

Harvard Professors Schlesinger and Heskett (1990) propose a relationship between individuals' job satisfaction and the quality of service provided to their customers. This research could be widely beneficial to other organizations if it successfully substantiates a relationship between employee attitudes, performance, and customer service.

Air Force Supply Squadrons support other base organizations which depend upon them to deliver goods and services in a timely manner. Flores' research was conducted within Tactical Air Command (TAC) Base Level Supply Organizations. From the customer's viewpoint, Supply Personnel were not performing according to expectations (Flores, 1990:71). This research will ask Supply Personnel to assess their own performance and seek an indication of their job satisfaction, organizational commitment, and satisfaction with rewards. It is hoped that these results can be used in conjunction with Flores' findings to determine what changes (if any) need to be conducted within Supply to improve customer satisfaction.

Research Questions

What variables are involved in the lack of customer satisfaction with the service provided by TAC Base Level Supply Personnel? Is it possible to determine the probable causes of the lack of customer satisfaction with the service provided by TAC Base Level Supply Personnel?

Hypotheses

The following hypotheses are posed to develop testing criteria needed to answer the research questions.

1. Supply Personnel's job satisfaction and organizational commitment levels cause their performance, which is indicated by the quality of service they provide to the customer.

2. Supply Personnel's performance causes their job satisfaction and organizational commitment levels.

3. Rewards allocated to Supply Personnel cause performance, which in turn cause their job satisfaction and organizational commitment levels.

Scope of the Research

The research uses the Minnesota Satisfaction Questionnaire (MSQ) and the Organizational Commitment Questionnaire (OCQ) to determine job satisfaction and commitment levels

of Supply Personnel. The short form of the MSQ provides an indication of intrinsic, extrinsic, and general satisfaction (Brief, 1989). Both intrinsic and extrinsic job satisfaction are relevant to this research. Intrinsic job satisfaction (employee rewarding self for performing well) has been found to be highly related to both performance and job satisfaction (Lawler and Porter, 1967:24). Extrinsic reward satisfaction (organizational rewards such as pay and promotion) are believed less important but, if performance contingent, can be hypothesized to lie in the causal chain between satisfaction and performance (Cherrington and others, 1971:535). The general job satisfaction score used in this research includes both intrinsic and extrinsic attributes and is obtained by combining all questions from the MSQ.

The short form of the OCQ provides information on commitment which is believed manifested in three ways: motivation to perform; goal/value congruency between the employee and the organization; and, intent to leave the organization (Mowday and others, 1979). All nine questions from the OCQ are combined to provide an indication of overall commitment in the employee.

To gain an indication of reward satisfaction, a self developed questionnaire is used along with the MSQ and OCQ. Five questions are designed to obtain both intrinsic and extrinsic reward satisfaction levels. These questions deal with the employees' assessment of the rewards given for

their efforts in handling customer problems and concerns. The first two questions attempt to determine if employees are intrinsically rewarded through their customer service efforts. The other three questions are designed to indicate the extent to which rewards for customer service are performance contingent.

A model is developed for those variables under consideration. Figure 1 depicts the possible interaction of the predictor variables (job satisfaction, organizational commitment, performance contingent reward, and reward satisfaction) with each other and with the criterion variable (performance). (For this study, indicators of performance include self ratings provided by the respondents and information on customer service derived through Flores' thesis.) Plain lines join the predictor variables, signifying a suspected relationship without regard to causal direction. Each predictor variable is hypothesized to relate to the criterion variable which may then interact with another predictor variable. The arrows represent hypothesized causality between the variables. Within the border of the model, are all other environmental factors which may have an effect on either the predictor or criterion variables.

After the results from the survey are analyzed, the relationships between the variables may be revised. Thus, Figure 1 is formulated as a foundation upon which to base this research:

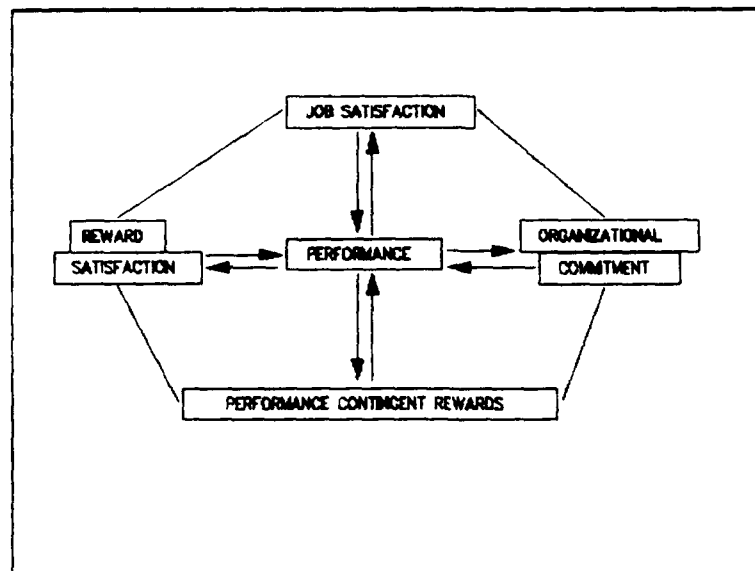


Figure 1. Relationship between work attitudes, rewards, and performance.

Literature Organization and Review

The literature review contains five major sections: Job Satisfaction; Organizational Commitment; Reward Satisfaction; Performance Contingent Rewards; and Customer Service. The review can be considered a broad indicator of the information available in each area. Topics relevant to this research are highlighted and emphasized when appropriate.

Job Satisfaction

Job satisfaction is one of the most widely studied variables in organizational behavior (Daft and Steers, 1986:77). The extensive research involving job satisfaction is summarized below.

Job satisfaction is defined as a "... pleasurable

emotional state resulting from the appraisal of one's job as achieving or facilitating the achievement of one's job values" (Locke, 1969:69). The study of job satisfaction is considered one measure of an individual's emotional response to the work situation.

Studies indicate that job satisfaction is related to job performance, absenteeism, and turnover (Petty and others, 1985). However, what leads to a lack of job satisfaction and the type of effects that can be attributed to dissatisfied employees are still not completely understood.

Most job satisfaction research was accomplished over the past thirty years. Zaleznik and others (1958) established the foundation for job satisfaction research. He believed an individual's level of satisfaction could be separated into major areas and studied. This contradicted many other theorists who believed the individual and his level of satisfaction were a cumulative whole, whose parts could not be split off and measured (Zaleznik and others, 1958:256). Organizational behaviorists began to postulate various explanations of the satisfaction--performance relationship and new schools of thought emerged. Their theories initially contradicted, but later, built upon their colleagues' previous ones.

Three distinct schools of thought have been developed concerning the job satisfaction--job performance relationship. These are summarized by Petty, McGee, and Cavender as:

1. Satisfaction causes performance (s-> p)
2. Performance causes satisfaction (p-> s)
3. The satisfaction--performance relationship is moderated by a number of variables. (Petty and others, 1984:12)

Each school of thought is dealt with individually.

The topics are organized in the following order: satisfaction causes performance (s-> p); performance causes satisfaction (p-> s); and, the effects of moderating variables on the satisfaction-performance relationship.

Satisfaction Causes Performance (s-> p). The human relations movement began shortly after the Hawthorne studies. Deeply rooted in the human relations theory, is the premise that a happy employee is also a productive employee. Although this theory is both logical and plausible, early researchers (Brayfield and Crockett, 1955; Vroom, 1964) found it difficult to substantiate a strong relationship between satisfaction and performance. However, Organ (1977) reviewed the major studies of s-> p. He shed new light on the theory, previously dismissed by most organizational psychologists as invalid and "intellectually bankrupt" (Organ, 1977:46).

In 1955, the first s-> p researchers (Brayfield and Crockett) found no support for the satisfaction causes performance theory. Researchers in the early 1960s used the social exchange theory to explain the satisfaction causes performance phenomena. "A unifying theme to this stream of thought is the assumption that most people expect social justice or equity to prevail in interpersonal transactions"

(Organ, 1977:47). Thus, an individual who feels over-rewarded will try to reciprocate through extra effort.

Vroom (1964) reviewed 23 studies which had attempted to establish support for $s \rightarrow p$. Vroom found positive correlations in 20 out of 23 studies, with a median correlation of +.14. This led him to conclude ". . . that there is no strong pervasive relation between workers' job satisfaction and productivity" (Iaffaldano and Muchinsky, 1985:251).

Several years later, Lawler and Porter (1967) introduced a model which reversed the hypothesized causal relationship between satisfaction and performance. They maintained that performance occurs first, the individual receives rewards for that performance, and this leads to satisfaction. The satisfaction-causes-performance theory was then reversed and most researchers began to accept the relationship as Lawler and Porter suggested.

Satisfaction-causes-performance is dismissed by many in the organizational behavior field as a theory which can not be validated through testing. However, Organ (1977) maintained it is still applicable: "In summary, the argument here is that the satisfaction-causes-performance notion and the 'Human Relations' syndrome which it connotes deserve more judicious consideration than recently accorded it" (Organ, 1977:52). Organ declared that a consistent correlation exists between satisfaction and performance across all studies, and that the theory should be reconsidered (Organ, 1977:48). Moreover, Fisher (1980) contends the weak

s-> p relationship exists due to past measurement techniques. She suggests researchers have wrongly tried to correlate a general attitude with a specific behavior.

Fisher says:

To sum it up at this point, there is no reason to expect a single measure of performance to be related to overall job satisfaction. What should be strongly related to job satisfaction is a multiple-act, multiple-observation measure of a variety of work behaviors. (Fisher, 1980:609)

Iaffaldano and Muchinsky (1985) returned to s-> p by using meta-analysis to consolidate data from 74 previous studies. They attempted to gain an accurate estimate of the population parameters by employing a comprehensive review. The 74 studies included data on s-> p obtained from a total subject sample size of 12,192. In their analysis, they nearly duplicated Vroom's earlier correlation of +.14 with an overall correlation of +.146 (Iaffaldano and Muchinsky, 1985:254). The authors were compelled to conclude that only a slight relationship exists between s-> p. They suggested that the unusually high satisfaction--performance correlations found in 8 of the 74 studies reviewed ". . . occur infrequently enough to be within expectations due to chance alone" (Iaffaldano and Muchinsky, 1985:268).

Petty, McGee, and Cavender (1984) also used meta-analysis to statistically summarize the literature on the satisfaction and performance relationship. They separated previous studies into management and non-management groups. Significant positive correlations were reported for the

management group (+.31). The non-management group's correlation was found to be slightly higher than previously reported (+.15). In their conclusion, the authors proposed that organizations should emphasize human relations policies to become more effective. In essence, organizations that successfully implement programs that increase their employees' satisfaction may find that the performance is concurrently increased (Petty and others, 1984:715,720).

Performance Causes Satisfaction (p-> s). Organizational behaviorists continued to search for an explanation for the low but consistently positive correlation between job satisfaction and performance. Lawler and Porter (1967) considered over thirty previous job satisfaction studies and confirmed that a consistent correlation existed between satisfaction and performance. They asserted that what was unclear was why the relationship existed. They proposed that an external variable (rewards) moderated the s-> p relationship.

Briefly stated, good performance may lead to rewards, which in turn lead to satisfaction; this formulation then would say that satisfaction, rather than causing performance, as was previously assumed, is caused by it. (Lawler and Porter, 1967:23)

Lawler and Porter studied managers in five different organizations. As a result of their research, they developed the p-> s model. Rewards (both intrinsic and extrinsic) intervene between performance and satisfaction with intrinsic rewards being a greater influence in the p-> s relationship. Maslow identified intrinsic rewards as those

internally mediated by the individual. Thus, Lawler and Porter reasoned these rewards were more important in the p->s relationship because ". . . the individual can give them to himself for good performance" (Lawler and Porter, 1967:24). Extrinsic rewards (i.e., pay) are controlled by another individual and thus a weaker relationship exists between the reception of the reward and performance (Lawler and Porter, 1967:26).

Lawler and Porter further suggested that organizational effectiveness can be determined by how well the organization rewards performance. The degree of self-actualization among employees indicates whether the organization creates jobs which are interesting and challenging to the individual (Lawler and Porter, 1967:28).

Cooper and others (1979) surveyed both managers and hourly employees and found extrinsic rewards a poor promoter for employee satisfaction. Also, managers were more satisfied than non-managers. It is suggested that a "hierarchy gap" had formed since hourly employees do not have opportunities for intrinsic rewards traditionally reserved for management. The authors reported hourly employees were satisfied with their pay (extrinsic reward), but that was not enough to increase their overall level of satisfaction (Cooper and others, 1979:118).

Lawler and Porter's suggestion that performance-causes-satisfaction gained wide acceptance as a likely explanation for the relationship. Petty, McGee, and Cavender's meta-

analysis provided further support for p-> s. They also substantiated a difference between management and non-management's level of job satisfaction.

The stronger relationship between overall job satisfaction and job performance for higher level employees, coupled with the unexplained variance across studies for the pay and work correlates of performance, are supportive of the performance-causes-satisfaction theory. (Petty and others, 1984:719)

The authors proposed a circular relationship existing with rewards connecting the p-> s relationship. They reason that if the employee perceives the reward as inequitable, he/she will reduce their effort thus lowering performance.

Thus, the influence of rewards on performance and satisfaction is both logical and was validated through research. However, subsequent researchers began to suggest other moderating variables, beyond rewards, that may influence the satisfaction-performance relationship.

Moderating Variables on Satisfaction-Performance.

Lawler and Porter were the first researchers to firmly substantiate a relationship between satisfaction and performance. Other researchers pointed to the possible moderating effects of variables such as need for achievement, self-esteem, and goal setting on the satisfaction-performance relationship.

Triandis first suggested, in 1959, that pressure for production might decrease satisfaction and increase productivity, thereby reducing the relationship between the

two (Petty and others, 1984:713). Yet, it was over two decades later when Bhaghat (1982) researched organizational pressure to perform and established it as a moderator in the satisfaction--performance relationship. Calling pressure to perform a "situational moderator," Bhaghat concluded that employees in pressured jobs will not be satisfied even if they are top performers. However, in low pressure positions, employees who are top performers will likely be satisfied with their jobs (Bhagat, 1982:786).

Steers (1975) proposed that only certain types of individuals would exhibit behavior that indicated their performance influenced their satisfaction. He suggested an individual's need for achievement (n Ach) moderated the relationship between employee performance and job attitude. High n Ach individuals perform well because the performance itself is a type of intrinsic reward which these people value. Conversely, low n Ach individuals conform to a separate set of needs (Lopez, 1982:679). They have a high need for affiliation and value the social interaction more than performing well on the job. Basically, Steers reproduced Lawler and Porter's study replacing rewards with need for achievement as the moderating variable.

Inkson (1978) attempted to identify self-esteem as a moderator in the satisfaction--performance relationship but his subsequent analysis could not substantiate a relationship between the variables. He attributed the lack of correlation in the data to the characteristics of the sam-

pled population. "Workers in the industry have a largely "instrumental" orientation, . . . [they] see work as having little intrinsic value, but as being only a means to an end. . ." (Inkson, 1978:246). Thus, Inkson concluded that self-esteem is only correlated with performance if the specific job is valued by society.

Ivanevich and McMahon (1982) proposed that goal setting and feedback are important moderating variables in the satisfaction--performance relationship. The group which had set specific goals outperformed the non-goal setting group. Additionally, performance generated feedback was found to positively affect both performance and attitudinal variables (i.e., satisfaction, etc.). When possible, organizations should attempt to use self-generated feedback to increase worker productivity. The authors explain that self-generated feedback is preferred because it is an intrinsic reward for employees performing well in their assigned tasks (Ivanevich and McMahon, 1982:370).

Roberson (1990) re-examined the relationship between goal setting and job satisfaction. Consistent with Ivanevich and McMahon, the author found that a good predictor of job satisfaction appeared to be the perceived probability of goal success. An interesting finding in this study is that satisfaction is dependent on both past and present goal attainment (Roberson, 1990:39).

Although research shows that moderating variables exist in the satisfaction--performance relationship, behaviorists

continue to disagree on which moderators are the most influential. Lopez (1982) identified eight major moderating variables (other than rewards as suggested by Lawler and Porter) studied by job satisfaction researchers. These are; managerial levels, need for achievement, motivational type, performance reward contingencies, situational characteristics, pressure for production, higher order need strength, and occupational group. She proposed that future research attempt to fit the variables together to form a model (Lopez, 1982:345). Of these moderating variables, rewards, and, more specifically, performance-contingent rewards, may have a major bearing on this research. Hence, they are explored further and discussed separately.

Reward Satisfaction. An organization may reward employees in distinctly different ways. Researchers have grouped rewards into three broad dimensions: task, social, and organizational (Mottaz, 1985). The task dimension refers to intrinsic rewards associated with accomplishing activities within one's specific job. Jobs that are interesting, challenging, allowing for self-direction and responsibility, variety and creativity are considered intrinsically rewarding. The social dimension includes those extrinsic rewards gained from interacting with others during the course of the job. Included in this category are friendly, helpful, and supportive co-workers and supervisors. The organizational dimension refers to those extrinsic rewards given by the organization to directly compensate one for

one's efforts. These rewards include pay, promotions, benefits, and other forms of direct compensation (Mottaz, 1985:366).

Researchers have recognized that people desire different things from their jobs. The relative importance of different aspects of one's job is termed "work values." Some workers want more pay, while others want interesting and challenging work. This phenomenon has been studied to determine if certain groups of individuals value some types of rewards over other types. Unfortunately, the results have been inconsistent. Initially, low-level workers were thought to value extrinsic rewards while their higher level counterparts valued intrinsic rewards. Later research indicated all workers valued intrinsic rewards over extrinsic rewards, regardless of work level (Mottaz, 1985:368). Mottaz concludes, ". . . intrinsic task rewards are by far the most powerful predictor of overall work satisfaction across all occupational groups" (Mottaz, 1985:375).

The implications of Mottaz's findings are important for managers attempting to improve performance within their organizations. Since research indicates intrinsic rewards are the strongest predictors of work attitudes, and work attitudes have in the least a minimal effect on performance, individuals should be rewarded with intrinsic rewards when possible (Mottaz, 1987:543). Attempts to make the job more autonomous, interesting, and challenging would be well received by employees and would yield even greater benefits

for the organization. Where intrinsic rewards are not possible, extrinsic social rewards should be provided. The organization provides extrinsic social rewards by promoting an atmosphere that improves supervisor and co-worker relations with the employee. Only as a last resort, organizational extrinsic rewards should be considered to improve employee work attitudes. These have been shown to occasionally improve work attitudes of low-level employees (Mottaz, 1987).

Performance-Contingent Rewards. Rewards have been recognized as an acceptable and effective way to recognize and improve employee performance. Common sense dictates that management should understand, communicate, and reward desired behavior. Surprisingly, unwanted behavior, or poor performance, is sometimes promoted "unconsciously" through rewards, thus re-enforcing the wrong things.

Kerr (1975) cites many examples of organizations that hope for one behavior while rewarding another. For instance, a corporate president must decide between installing \$11 million in antipollution equipment (to protect fish in the adjacent river) or do nothing and assume only a minimal chance of incurring a \$1 million fine if caught. His creditors and stockholders reward cost consciousness or other criteria unrelated to the number of poisoned fish. Clearly, most corporate presidents would opt for breaking the law and hoping not to get caught since the behavior rewarded is the one usually done (Kerr, 1975:774).

Closely tied to rewards and performance is the rate of reinforcement. Rewards which are contingent on good performance reinforce that performance and promote it in future work situations. However, managers must ensure that positive reinforcers are not contingent on the wrong type of behavior. As Hamner explains in Hackman and others' Perspectives on Behavior in Organizations, "In short, intuition provides a poor guide to motivation" (Hamner and Hamner, 1983:311).

Positive reinforcement is a powerful tool which managers can use to strengthen behavior. B.F. Skinner found behavior that is positively reinforced tends to be repeated, while behavior which is negatively reinforced tends not to be repeated (Hamner and Hamner, 1983:311). Thus, management must first determine what type of rewards are valued by the individual (or group) and then provide them to increase performance. Once management determines the rewards valued, reinforcement should be made contingent on the desired performance. "Rewards must result from performance--and the better an employee's performance is, the greater his or her rewards should be" (Hamner and Hamner, 1983:311). Where management fails to reward desired behavior, the worker is forced to determine what behavior should be displayed in order to be rewarded. Those behaviors which are rewarded are the ones reinforced and thus repeated in the future.

Research tends to support this notion of the powerful effects of performance contingent rewards. Cherrington and

others (1971) proposed that there was not an inherent relationship between satisfaction and performance. However, both satisfaction and performance were proposed to be highly dependent upon performance-contingent rewards. The authors discuss three types of rewards found in an any organization. These include random, positively contingent, and negatively contingent rewards. Random rewards are awarded independently of performance; high and low performers are rewarded equally. Positively-contingent rewards are awarded strictly on the basis of performance: high performers are rewarded; low performers are not. Negatively-contingent rewards are awarded in a manner inversely related to performance: low performers are rewarded while high performers are not (Cherrington and others, 1971:532). Their study indicated that the relationship between satisfaction and performance is heavily dependent upon the performance-reward contingencies which are in effect. Although the conclusions drawn in the research was similar to that of Lawler and Porter, the authors make a distinction. While Lawler and Porter proposed that performance leads to rewards which causes satisfaction, Cherrington and his colleagues advanced no causal relationship between satisfaction and performance. Instead, they emphasized the power of rewards themselves, particularly, performance contingent rewards (Cherrington and others, 1971:535).

Jacobs and Soloman (1977) also explored the effects of performance contingent rewards and subsequently confirmed

Cherrington's results. Moreover, their sample was large (N=255) and the data was interpreted through a moderated regression approach. Their findings report significant differences for all variables when performance contingent rewards reinforce good performance (Jacobs and Soloman, 1977:418-420).

Ryan and his colleagues (1983) explained that contingent rewards are influential on employees because they require a specified level of performance to be administered (Ryan and others, 1983:741). Gupta (1980) found that performance contingent intrinsic rewards were positively associated with intrinsic and general job satisfaction. Further, performance contingent pay was found to be positively related to pay and general job satisfaction (Gupta, 1980: 821). However, her subsequent hypotheses failed to explain why the positive relationship existed between the two variables. Locus of control, feelings of equity, and tolerance of ambiguity did not help explain the positive relationship between performance contingent rewards and job satisfaction. Nonetheless, she was able to conclude that rewards precede satisfaction. Gupta reasoned that the organization establishes the reward structure first, and then the employees develop attitudes toward their environment. Thus, her assumption argues for ". . . a temporal sequence of events where the provision of performance contingent rewards precedes the experience of satisfaction" (Gupta, 1980:826).

In a controlled experiment, Smith (1984) found that workers who believed rewards were contingent on performance tended to outperform those workers who failed to recognize that rewards were tied to performance. Incumbency in an officially recognized position within the organization legitimizes supervisory authority, which in turn leads to conformance to rules and regulations put forth by the supervisor. Consequently, subordinates believe that their supervisor is a good source of information as to what is important or valued by the organization. Nevertheless, Smith concluded contingency of rewards was a stronger predictor of performance than were values communicated only through legitimate authority (Smith, 1984:1040-1043).

How do contingent extrinsic rewards effect performance? Vecchio (1982) found that contingent compensation rewards had a direct improvement upon the quantity of performance. In fact, contingently compensated workers had a 27% increase in productivity over the non-contingently compensated workers. These findings agreed with Lawler's earlier observation that contingent pay positively effects performance. As with other earlier research, Vecchio found that contingent pay had the strongest effect on performance for low-achievement workers (Vecchio, 1982:457,458).

Harackiewicz and Manderlink (1984) proposed individual achievement level orientation could have an effect on one's reaction to performance contingent rewards. They believed that individuals internally evaluate their competence

through the completion of tasks when performance contingent rewards are offered to them. They suggest as low achievers become more focused on their own competence through performance contingent rewards, that they care more about doing well than they normally would. Conversely, high achievers care more initially about competence than low achievers so performance contingent rewards may actually "undermine" their competence evaluation (Harackiewicz and Manderlink, 1984:535). They used multiple regression analysis to interpret the data from their experiment which validated their hypothesis:

The promise of a performance-contingent reward raised importance (relative to no reward) for low achievement subjects, but lowered it for those high in achievement orientation. (Harackiewicz and Manderlink, 1984:541)

In summary, those organizations who find that their employees are not adequately performing should focus on the reward system which has been installed. Management may find that they are hoping for one type of behavior, while rewarding (either overtly or implicitly) another. When it is found that the wrong behaviors are being rewarded, performance contingent rewards may be implemented to adequately reward the desired employee behaviors.

Organizational Commitment. Closely related to one's satisfaction with one's job is the amount of commitment felt toward his/her organization. Organizational commitment began to be recognized with Porter's work in the early 1970s and has continued to be widely studied over the last twenty

years. Like the amount of satisfaction one expresses in their job, commitment is also defined in terms of an attitude. One's attitude about job satisfaction involves feelings toward a specific job or task. However, one's attitude about organizational commitment involves feelings toward the much larger organization in which he/she is employed. When one is considered committed, his/her goals and those of the organization are said to be congruent or increasingly integrated (Mowday and others, 1979:225).

Although satisfaction and commitment are similar, they differ in distinct ways. Mottaz (1987) reports Price and Muller viewed satisfaction as an indication of the individual "liking" or feeling "happy" with his/her job. Commitment, on the other hand, refers to the degree the individual is "loyal" or "attached" to his/her organization (Mottaz, 1987:544).

Hom and Hulin (1981) made the distinction between job satisfaction and organizational commitment by comparing the individual's attitude in specific versus general terms.

Organizational commitment is the general attitude an individual has toward an organization, while job satisfaction is composed of specific attitudes toward corresponding aspects of the particular job an individual has in the organization. (Hom and Hulin, 1981:1)

The final distinction between the constructs is that organizational commitment is thought to be a more global construct than job satisfaction. Whereas an individual may be temporarily dissatisfied with a certain facet of the job, his/her commitment develops slowly over time and is less

likely to change. Commitment levels and attachment to the organization are closely tied and are well documented in the literature. An individual who feels very little commitment to the organization will often display this attitude in a very real way--by quitting. Thus, intent to leave is often studied and has been confirmed to relate inversely with organizational commitment (Mowday and others, 1979: 226,235). Of greater importance to this study, commitment was found to be modestly related to job performance. The authors explain the modest relationship in terms of other confounds which interact on performance.

Finally, we would expect commitment to be modestly related to employee performance. This relationship should not be overly strong in view of the many factors that have been found to influence performance (e.g., role clarity, reward systems, etc.). (Mowday and others, 1979:240)

Organizational commitment and job satisfaction are also related. When compared with data obtained using the Job Diagnostic Index (JDI), organizational commitment had the strongest strength of association with the work itself and commitment was moderately related to the other constructs measured by the JDI. These include supervision, pay, promotions, and co-workers (Mowday and others, 1979:237,238).

Wright (1990) conducted research in the banking industry to determine teller job satisfaction and organizational commitment levels. The author wanted to determine if career-oriented tellers had higher levels of these constructs than their non-career counterparts. Concerning job

satisfaction, it was determined that both groups were more satisfied when they had an effective supervisor, good co-worker relationships, and an equitable reward system. Turning to organizational commitment, it was determined that two separate factors determine the level of commitment for each group. For career-oriented tellers, the supervisor determines commitment strength. When the supervisor uses participative management techniques and provides feedback, the career tellers are more likely to report higher levels of organizational commitment. However, commitment for the non-career tellers seemed to depend more on the work group. Apparently, functioning in competent and cohesive work groups, caused the non-career tellers to report consistently higher levels of organizational commitment (Wright, 1990: 375-377).

Shore and Martin (1989) studied job satisfaction and organizational commitment's relationship to job performance and turnover intentions. In this case, commitment was found to relate more strongly to turnover and job satisfaction related stronger to performance (as rated by supervisors). The authors report that their findings concur with earlier research which maintains global attitudes are associated more closely with organization-oriented outcomes (turnover), and more specific attitudes are more closely associated with task-oriented outcomes (performance). An actual indicator of performance (teller's over or short register records) was compared to the teller's satisfaction and commitment levels.

In this case, commitment was found to more closely relate to performance than satisfaction. The employees with higher commitment levels tended to perform better. The contradiction is explained by viewing the two indicators of performance in the time frame in which they were gathered. The over and short records were gathered over a one year period, thus long term in nature. Conversely, the supervisors were asked to rate the tellers on their present job performance. Therefore, it is reasoned that the long term indicator of performance relates more closely to the long term attitude (commitment) and the short term indicator of performance relates more closely with the short term attitude (satisfaction) (Shore and Martin, 1989:633).

Meyer and others (1989) reviewed the theory of organizational commitment in the two distinctly different veins in which it was initially proposed. Porter defined commitment in identification terms, while Becker described commitment merely as consistent lines of activity. This review broke organizational commitment into either affective commitment (Porter's view) or continuance commitment (Becker's description). Next, these two types of commitment were compared with job satisfaction and performance. As affective commitment increased, the supervisory ratings of performance tended to positively increase. Conversely, as continuance commitment increased, the performance ratings were found to be inversely related. In essence, individuals who are committed primarily due to the cost of leaving and finding

new employment, perform poorly when compared with those individuals who are committed because they have the same goals and desires as the organization. Another finding in this study, was that job satisfaction did not correlate significantly with performance (Meyer and others, 1989:154).

Mottaz tested the relationship between satisfaction and commitment. He used the two-stage least-squares procedure to estimate the reciprocal effects of work satisfaction and organizational commitment. His findings indicated that satisfaction had a much larger impact on commitment than commitment did on satisfaction.

The findings indicate that satisfaction accounts for approximately 42% of the explained variance in commitment, while commitment accounts for only 4% of the explained variance in satisfaction. (Mottaz, 1987:551)

Glisson and Durick (1988) studied human service organizations to determine the predictors of job satisfaction and organizational commitment. They gathered the variables used by researchers to predict satisfaction and commitment. These variables were then divided into three groups: variables describing characteristics of the job tasks; variables describing organizations in which the job tasks are performed; and, variables describing characteristics of the worker performing the job tasks (Glisson and Durick, 1988:61). Their analysis revealed that characteristics of the job best predict the indicated levels of satisfaction and commitment. Not surprisingly, skill variety had a significant positive effect on job satisfaction. As previ-

ous research has indicated, the greater variety of skills the individual is allowed to use in his/her job, the more satisfied that individual will be. On the other hand, role ambiguity had a significant negative effect on satisfaction. The less certain the individual is of his/her specific role and responsibilities in his/her job, the less satisfied the individual will be. Concerning commitment, the characteristics of the organization are the best predictors. Organizational age and leadership have the largest impact on individual commitment. Worker characteristics did not predict satisfaction and only explained a small (but significant) variation in worker commitment. The higher the education level of the worker, the lower the worker's level of commitment. It is reasoned that the highly educated worker believes better job opportunities exist; thus, he/she has less commitment to their current organization (Glisson and Durick, 1988:74,77).

Very few studies have compared organizational commitment and its effect on job performance. Shore and Martin report that research in this area determined that commitment was not clearly related to performance (Shore and Martin, 1989:627). However, their own research (mentioned above) indicated long term performance measures are related to commitment. Perhaps researchers have shied away from the comparison due to the weak link reported in the literature concerning satisfaction and performance. Glisson and Durick (1988) draw an important conclusion from the combined ef-

fects of satisfaction and commitment. They reason that worker-client interactions play an important role in the success of human service programs. Attitudes of the workers affect adequate resolution of the client's problem. Since worker attitudes are a function of the organization and job task characteristics, success of human services depend upon how the organization is designed and those services administered (Glisson and Durick, 1988:78).

This final point has direct implications for this research. As customer service employees interact with their clients, their work attitudes (either good or bad) have a direct bearing on the quality of service provided. The identification of satisfaction and commitment levels can be considered a measurement by which management can determine how well policies and procedures either facilitate or detract from, the worker's ability to function.

Customer Service and Employee Work Attitudes. As we move into the 1990s, organizations appear to be paying closer attention to their customers than ever before. More particularly, companies are increasingly concerned with their employees' interaction with the customer and how that affects customer retention and thus profits. Companies that have incorporated the customer service doctrine have found a surprising side effect; employees who sense they are satisfying the customer are more satisfied themselves (Sellers, 1990:59).

Changing Views Toward Employee Attitudes. It is important to take a historical review of business and the philosophies that have driven it into the modern era. The Hawthorne Studies (late 1930s) are generally considered to have ushered in the human relations movement. Soon management was advised by leading industrial psychologists to become more aware of individual needs and the importance of certain rewards. Theorists in the 1950s introduced the relationship of goals to needs:

Individuals don't behave in random unrelated ways, rather they are motivated by a goal. Individuals have many different, but related, needs which they seek to satisfy through their behavior in all life settings, work being one of these settings. (Zaleznik and others, 1958:323)

Job rotation, job redesign, and job enlargement were introduced in the 1960s. Foulkes laments in his book, Creating More Meaningful Work, "If management is to stop the trend toward dehumanization of work and tap man's potential more fully, it must shape the environment into a stimulus not a suppressor" (Foulkes, 1969:17).

The 1970s ushered in the age of the system. Everything was considered to be a part of a larger system and the focus was to "fit" the individual into the system. Job fit was the objective; management's task was to match each individual with a specific job in the organization. When the employee did not appear to seek a higher position within the firm, he was thought to be satisfied because his potential matched the requirements of the job (Exton, 1982:171).

However, researchers soon suggested that employees were growing discontented with their jobs and that a "hierarchy gap" had formed (Cooper and others, 1979:117). This gap had formed due to an apparent relationship between job satisfaction and job level. Generally, managers were found to be more satisfied with their jobs than hourly employees. It was further concluded through studies that hourly workers wanted opportunities for intrinsic rewards, which had traditionally been reserved for management. Although most employees seem satisfied with their pay, this satisfaction didn't offset a high level of overall job dissatisfaction (Cooper and others, 1979:118). The esteem-related items were rated most critically by the dissatisfied hourly employees. Management was reminded once again that even low level subordinates needed to be treated equitably, with respect for their problems, and afforded avenues for advancement.

In the 1980s, industry began to recognize firms which had a high level of respect for their employees. In the best selling book, A Passion for Excellence, Tom Peters described successful companies with the emerging "employee first" attitude. Jim Treybig's (Tandem Company) philosophy: "People are good; people, workers, management and the company are the same thing; every single person in the company must understand the essence of business and every employee must benefit from the company's success." Bill Black (Teleflex) offered a similar view: "people are people--not per-

sonnel; people don't dislike work. . . help them understand mutual objectives and they'll drive themselves to unbelievable excellence" (Peters, 1985:206).

Customer Service. Meanwhile, other companies began to promote a "customer first" philosophy. As early as the late 1970s, companies began to ask; "What can we do to hold customers, keep them satisfied and keep them coming back to buy more of our products and services?" Many successful firms began to realize that customer service wasn't just a function or activity, but rather a corporate philosophy and attitude (LaLonde and Zinszer, 1976:205).

During the last decade, firms began to understand the importance between customer and employee interaction. Customer Service Training Seminars began to fight the "I just work here syndrome," telling companies to:

Make employees feel important; teach them their primary job is to serve the public; and, that they're part of a fragile system operating efficiently and effectively only when each part is functioning properly. (Magnesen, 1987:52)

McDonald's took the idea one step further in their employee training programs. They began to speak not only of customer satisfaction, but personal satisfaction derived from providing good service. New employees were told:

You are special and you want the satisfaction of knowing your work helps others--other employees, customers and yourself. . . you get a clear idea of how a system runs and how all the little things add up to the satisfaction of the customer and the crew--primarily yourself. (Desatnik, 1987:72)

McDonald's and other companies came to the realization that role clarity was the vital first step in employee satisfaction and that well trained employees are generally satisfied employees. Companies began to strive for the integration of employees' needs with those of the organization, with the results satisfying customers' needs.

Integration of Work Attitudes and Customer Service. The 1990s have already been labeled the "Decade of the Customer" (Phillips and others, 1990:88). As companies mature and fight to retain their market share, they have realized that to compete and continue to grow they must hold on to current customers. However, this is no automatic process. It rests with the fragile link between an employee and the customer. In fact, a recent survey found that "the personal touch," (how committed a company representative is to a client and whether he remembers the client's name) is the most important element of customer service. Even more important than convenience, speed of delivery, or how well the product performs (Sellers, 1990:58). Management seems to have realized that the personal touch is easier to attain when they treat their own people better.

Role clarification, recognition, respect, and achievement are beginning to be understood and implemented. Yet, Hertzberg and other organizational behaviorists have been espousing the importance of these elements for years. Could it be that management finally has found a reason to listen and adopt industrial psychologist's recommendations? In-

deed, Harvard professors Leonard A. Schlesinger and James L. Heskett think so. They have proposed two models which describe a connection between employee satisfaction and customer service. Figure 2 illustrates the negative cycle of dissatisfied customers and employees:

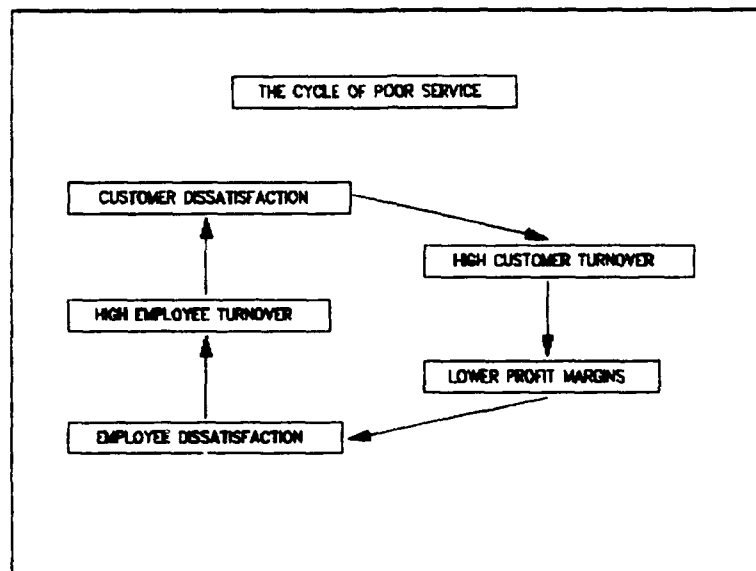


Figure 2. Relationship between employee dissatisfaction and customer dissatisfaction. (Sellers, 1990:59)

Schlesinger and Heskett point to internal elements that start the cycle of poor service. These include: narrow job design; emphasis on rules versus service to customers; using technology to control quality; payment of low wages; and, minimization of selection effort and training. These factors perpetuate boredom and prevent the employee from adequately responding to customer problems and concerns (Schlesinger and Heskett, 1990:5).

Figure 3 illustrates the benefits of satisfied customers and employees:

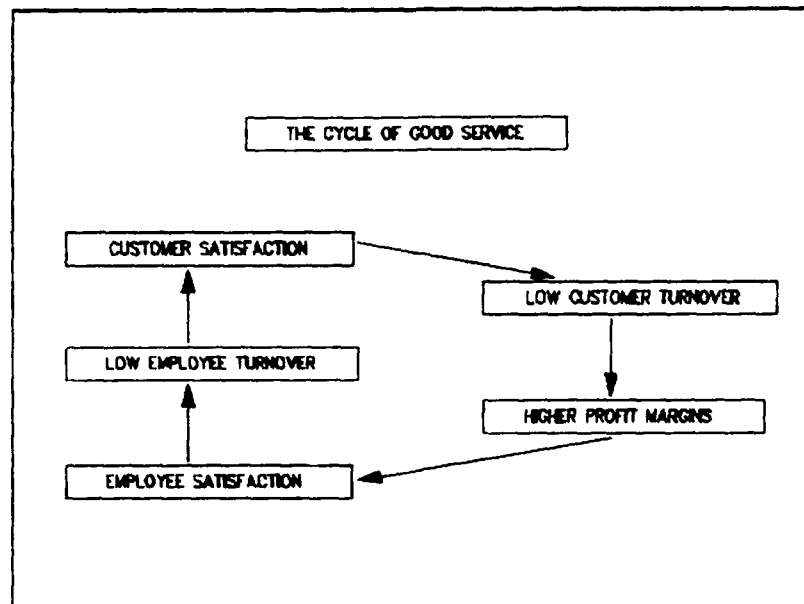


Figure 3. Positive relationship between customer and employee satisfaction. (Sellers, 1990:59)

When the cycle of good service is promoted by the firm, the following interpretation is suggested: satisfied employees stay on the job; they serve the customer better, who in return continues to do business there; profit margins increase; greater rewards are allocated to employees; and, positive work attitudes prevail.

Several past job satisfaction studies partially validate the model's proposal. Drawing on Baird's (1976) conclusion pertaining to nonstimulating jobs (which have been considered to characterize the service industry), the workers are exhibiting a high level of satisfaction through

their high performance of service. Abdel (1980) might suggest these non-managerial employees' high-order needs are being met; thus, a positive satisfaction-performance relationship. Finally, a theorist of the moderator approach would probably suggest that management is rewarding employees who are dedicated to their customers, pointing at the reward as the link between satisfaction and performance.

Conclusion and Application. The connection between work attitudes and customer service can be applied to non-profit firms, such as the military. For example, work attitudes of personnel performing customer service functions in Base Supply may relate to how well they serve (performance) their customers (other base organizations). Research in this area will not only attempt to validate the relationship, but indicate negative or positive effects emanating from the relationship between satisfaction and performance. Once management has the results from valid research, attempts to improve their customer service orientation may improve satisfaction of both their own personnel and other personnel outside of their organization.

Until further research is done in this area, no one will know if satisfaction of employees really has an effect on customer service and retention. However, one thing is certain: successful companies aren't waiting for "proof" from the scientific community. Employee and customer satisfaction are combining with the best result of all--an improvement in the bottom line. Consultant Tom Peters recent-

ly remarked, "When you make the customer first, second, and third, you're doing the same for your employees" (Sellers, 1990:68).

In justification for reappraisal of the job satisfaction-performance issue, Petty concludes ". . . the general public may believe that there is a relationship between job satisfaction and performance. Perhaps it is time for academic researchers to reach the same conclusion" (Petty and others:720).

II. Methodology

Chapter I identified the purpose of the research and presented a review of the literature concerning the variables under examination. This chapter identifies those methods used to capture and compare the predictor variables (job satisfaction, organizational commitment, performance contingent reward, and reward satisfaction) with the criterion variable (performance). The demographic characteristics of the sampled population are also examined for effects bearing on the relationship between work attitudes and performance. Models for analysis are proposed, as well as the techniques used in their evaluation.

Research Design

An ex post facto design is used to obtain information on the work attitudes of employees within TAC Base Level Supply Organizations. TAC Base Supply was surveyed for several reasons. First, Flores (1990) surveyed the customers of Base Supply and found that Supply employees were not performing according to their customers' expectations (Flores, 1990:71). Second, this research dealt with work attitudes and performance. One of the goals of the research was to test the nature of relationships between job satisfaction, organizational commitment, rewards (intrinsic and extrinsic), and performance. Moreover, Flores' research

estimated Supply employees' performance through customer responses. This research allows the Supply employees to rate their own performance, giving a further indication of their effectiveness in meeting the customers' needs. Third, Col Van A. McCrea, Director of Supply, Tactical Air Command, was interested in finding out more about the personnel issues within his base level organizations which were raised through Flores' research. He officially endorsed the research with a letter to all Supply Squadron Commanders requesting their support for the project (Appendix A). Additionally, his letter asking each recipient to complete the questionnaire was attached to the front of each survey package (Appendix B).

Information on work attitudes is developed through data obtained by a mail survey. The overall purpose of the survey is to identify those variables responsible for Supply personnel's performance, and to determine the role that work attitudes and rewards play in the performance of employees assigned to Base Supply organizations.

Mail survey is more appropriate than observation for several reasons. First, the geographic location of the bases and time limitations make observation impractical. Second, information on internal attitudes and opinions can rarely be derived except through questioning (Emory, 1985:158). Lastly, only through a reliable and valid survey can differences truly be determined between the two groups of employees.

Instrument Design

The survey consists of five parts (Appendix B). Part I, Background Information, is designed to collect demographic factors which are used to determine the individual differences among the respondents. Respondents are asked to provide the following: grade; time in service; base of assignment; organizational level; specific section of assignment; and, length of time assigned to their specific section.

Part II, Job Satisfaction, is used to determine supply employees' level of job satisfaction. This section uses the short form of the Minnesota Satisfaction Questionnaire (MSQ) (Weiss and others, 1967). The MSQ contains twenty questions providing information on the following factors: ability; utilization; achievement; activity; advancement; authority; company policies and practices; compensation; co-workers; creativity; independence; moral values; recognition; responsibility; security; social science; social status; supervision-human relations; supervision-technical; variety; and, working conditions. All of these items are combined to give an overall indication of job satisfaction.

Part III, Organizational Commitment, contains the nine positively worded questions from the Organizational Commitment Questionnaire (OCQ) developed by Lyman W. Porter and his colleagues (Mowday and others, 1979). The OCQ is used to determine the respondents' overall commitment to their

organization. The OCQ evaluates the respondents' job involvement and career satisfaction. Organizational commitment describes the individual's attitude toward the organization and indicates his/her motivation to perform, goal value congruency with the organization, and desire to maintain membership in the organization. The OCQ is designed to provide the individual's overall level of commitment to the organization, which often is an indicator of performance and satisfaction (Mowday and others, 1979).

Part IV, Perceived Self Performance Measure, consists of five questions asking the respondents to rate their own job performance over the past six months. The questions were originally developed and used in The AFIT Survey of Work Attitudes (Steel and others, 1983). Respondents rate themselves on their ability to effectively produce high quality work in significant quantities while handling emergency situations that arise in their job situation.

Part V, Reward Satisfaction, is an author-developed questionnaire designed to obtain both intrinsic and extrinsic reward satisfaction levels. This questionnaire was part of a ten-item instrument originally developed in two-parts: Customer Service and Reward Satisfaction. The initial ten-question instrument was pre-tested with a group of nine AFIT students possessing a Supply Air Force Specialty Code (AFSC). During pilot testing, reliability measures of the Customer Service section were found to be quite poor ($\alpha < .20$). One possible explanation is that the importance of

customer service and its associated responsibilities are viewed quite differently by various types of employees. Nevertheless, the low Cronbach alpha indicated the measurement contained too much error so the customer service portion was eliminated.

The other section of the questionnaire, Reward Satisfaction, contained five questions designed to measure the respondents' satisfaction with rewards they receive for customer service efforts. This sections' Cronbach alpha found during the pre-test was .67. Thus, this measure was considered fairly reliable and considered acceptable for use in subsequent research. However, one of the questions was subsequently reworded with the hope of improving the reliability of the instrument. For intrinsic reward satisfaction, the respondents were asked to indicate their feelings of accomplishment and the appreciation they felt that their supervisors had for them, when handling customer problems and concerns. For external reward satisfaction, the respondents rate the organization on the degree to which it externally rewards customer service efforts. External rewards are given through promotion or other direct means. Although developed for use in this research, the Reward Satisfaction Questionnaire is broadly worded and is not strictly limited for use in research within Base Supply or other military organizations.

Population and Sample Characteristics

The population consisted of all enlisted members assigned to eighteen Continental United States (CONUS) TAC Supply Squadrons. From each base, 10% of the enlisted supply personnel population were randomly sampled. All personnel with a Social Security Number (SSAN) ending in the number "2", were asked to complete the survey. The number "2" was randomly picked out of those possible (0-9). The entire population was estimated to equal 3,600 (Sullivan, 1990). As an average, 200 enlisted personnel are assigned to each Supply Squadron. Thus, twenty surveys were mailed to each base for a total of 360 surveys distributed. Although the actual population was later calculated to equal 4800 (Martin, 1991), a sample size of 361 is sufficient for a population up to 6,000, using an alpha of .05 (Krejcie and Morgan, 1970:608). Thus, the sample size chosen effectively provided for a random representation of the population.

Enlisted personnel, as a group, perform jobs which require regular interaction with the customers of Supply. Conversely, officers perform more of an administrative and managerial function which is not directly related to the service of Supply's customers. Thus, eliminating officer responses reduces the systematic variance within the sample. Systematic variance is "the variation in measures due to some known or unknown influences that 'cause' the scores to

lean in one direction more than the other" (Kerlinger, 1973:74).

Each of the eighteen TAC Base Supply Commanders received the survey package with a cover letter from HQ TAC/LGS (Director of Supply) explaining the nature of the research. Commanders were asked to appoint a survey point of contact (POC). The POC ensured that all available individuals with a SSAN ending in "2" completed the survey and returned it. Random sampling of 10% of the population ensured that the organizations did not "hand pick" the respondents. Therefore, the design of the research effectively minimizes bias in the results.

Data Collection

Details of Collection. Each squadron commander was sent the survey package and appointed a POC to distribute the survey to the targeted sample. Once the respondent completed the survey, he/she personally sealed it in the pre-addressed return envelope. The respondent was thus ensured confidentiality and was more likely to be candid when answering the survey. Moreover, Air Force policies of confidentiality were complied with.

Grouping the Data. All questions are grouped according to the variable of which each is a part. After testing the variables for collinearity, the sample was divided into two groups. The first group, customer service personnel, work

in one of the following nine sections: Customer Service Unit; Demand Processing; Stock Control; Equipment Management; Mission Capable (MICAP) Unit; Base Service Store; Shop Service Center; Aircraft Generation Squadron (AGS) Parts Store; and Material Control. Capt Flores (1990) reported these sections are the primary customer contact points within TAC Base Level Supply (Flores, 1990:117). The other group is composed of those individuals who do not serve the customer directly as a major part of their jobs. Examples of the jobs these personnel hold include warehousing, administration, internal analysis, systems, and fuels storage and processing. For sample adequacy, the sample percentages should approximate the percentages of the entire supply organization. Each of these groups should split the Supply population in half with the employees in customer service positions thought to slightly outnumber those in non-customer service positions (Sullivan, 1990). However, once all surveys were returned, the group of customer service employees made up about 43% of the total sample.

After separating the respondents into two groups, the groups' mean scores on each variable were analyzed to compare differences. These differences, if significant, would support the contention that situational factors play a significant role in employee work attitudes and performance.

Validity

Two major types of validity are considered relevant to this research. Internal validity indicates the extent to which the instrument actually measures what it is intended to measure (Fowler, 1984:85). External validity describes the extent to which the results of the research can be generalized across persons, settings, and times (Emory, 1985:115).

Internal Validity. Internal validity is ensured through the use of existing instruments. The MSQ, OCQ, and the Perceived Self Performance Measure have previously been tested to provide evidence that the measurements gained from the questionnaire are generally free of random error (Brief and Roberson, 1990; Mowday and others, 1979; Steel, 1990). Cronbach's Coefficient Alpha is the statistical procedure employed to ensure reliability, an important element of internal validity. Reliability coefficients range from 0 to 1. A coefficient closer to 1 indicates greater reliability, or less random error associated with measurement of the variable under consideration.

The MSQ has been used extensively in job satisfaction studies since being developed in 1967 (Iaffaldano and Muchinsky, 1985:256-261). Brief and Roberson (1989) analyzed three often-used job satisfaction scales: Job Descriptive Index (JDI), Minnesota Satisfaction Questionnaire (MSQ), and the FACES scale. The authors found the MSQ was a highly

reliable (Cronbach's alpha = .89) measure of job satisfaction (Brief and Roberson, 1989:718). In their study of 144 workers, all three scales proved to be good measures of job satisfaction, although the FACES measure had the highest correlations with the affective components under study (Brief and Roberson, 1989:723).

Mowday and others (1979) tested the OCQ and found it to be highly reliable and valid. Cronbach's Coefficient Alpha across nine studies ranged from .82 to .93, with a median of .90 (Mowday and others, 1979:232). An item analysis was performed to determine how well each question correlated with the total commitment score. Individual questions correlated positively with the total OCQ score across all studies. Average item-total correlations ranged from .36 to .72 with a median correlation of .64. Test-retest reliability was $r = .53$, $.63$, and $.75$ over two-, three-, and four-month periods for the study (Mowday and others, 1979:232-234). Evidence existed for convergent, discriminate, and predictive validity. A short discussion of each type of validity follows.

To check for convergent validity, the researcher compares the instrument under consideration with a similar instrument. The OCQ was correlated with the Sources of Organizational Attachment Questionnaire (SOA), a 12-item scale previously developed ". . . to measure the perceived influence of various aspects of the job, work environment, and organization on the individual's desire to remain with

or leave the organization" (Mowday and others, 1974). The OCQ and SOA results were correlated across six different samples. Convergent validities across the six samples ranged from .63 to .74, with a median of .70 (Mowday and others, 1979:234).

Discriminate validity is used to separate the commitment construct from other attitudinal variables, such as job satisfaction. Now, the researcher desires some, but not overly high, correlations to allow for discrimination between commitment and other work attitudes. For discriminate validity, the OCQ was compared against three other attitude measures: job involvement; career satisfaction; and job satisfaction. The authors report acceptable levels of discriminate validity: correlations between the OCQ and the job involvement measure ranged from .30 to .56; between the OCQ and the career satisfaction measure ranged from .39 to .40; and, between the OCQ and the JDI ranged from .01 to .68 (Mowday and others, 1979:237).

For predictive validity, the OCQ was tested to check its ability to predict turnover and performance. In a comparison between the OCQ and the JDI in a longitudinal study, the relationship between commitment and turnover strengthened over time, while the JDI failed to adequately predict turnover. Concerning performance, the authors found a positive but modest relationship existed between commitment and job performance (Mowday and others, 1979:239).

The Perceived Self Performance Measure was developed by professors at the Air Force Institute of Technology (AFIT) for use in the AFIT Survey of Work Attitudes. This survey was administered to thousands of DOD employees from 1982-88. A portion of this large data base was analyzed for reliability purposes in ORSC 661, Making Sense of Research Data, a graduate course taught at AFIT. The Perceived Self Performance Measure had a very high reliability coefficient of .89. This evidence indicated the measurement is a reliable instrument for obtaining an indicant of job performance.

The author-developed questionnaire, Reward Satisfaction, was designed to measure the employees' intrinsic and extrinsic satisfaction with the rewards given for customer service efforts. Content validity of an instrument involves the ability of a measurement to adequately and accurately cover the domain of the variable under consideration (Emory, 1985:95). To ensure content validity, experts in the area of interest should be consulted. Professors from the Communication and Organizational Behavior Department, Air Force Institute of Technology, reviewed the instrument for wording and content. Furthermore, the Director of Supply, Headquarters Tactical Air Command, assessed the instrument's ability to accurately capture the variables of interest. As a result of these reviews, modifications were made to the self-developed questionnaire.

Construct validity concerns the attempt to ". . . infer the presence of abstract characteristics for which no empir-

ical validation seems possible" (Emory, 1985:97). The researcher must determine the degree that the numerical data accurately measure the variable(s) under study. A correlation analysis is often the only method of ensuring construct validity. In this research, the variables composed from the questions under the self developed instrument are correlated with job satisfaction variable (identified by the MSQ), to provide evidence of construct validity.

To determine reliability, Reward Satisfaction (Part V), was pre-tested with a group of nine students from AFIT. These students had previous job experience as Supply Officers and were the most qualified to answer questions concerning satisfaction with the rewards given for customer service efforts. The students' responses were analyzed using the Statistical Package for the Social Sciences (SPSS-X, 1986) reliability procedure. The initial Cronbach Alpha of .67 indicated that this part of the instrument was fairly reliable. However, minor modifications were made on one of the five questions with the goal of improving the reliability coefficient for the sampled population. Should these changes raise the reliability coefficient above .70, the self developed questionnaire would be considered a good indicator of both intrinsic and extrinsic reward satisfaction. Following the collection of all surveys from the field, the reliability procedure was again conducted. The Cronbach alpha rose to .78, indicating the instrument was a reliable measure for determining satisfaction with rewards.

External Validity. Emory (1985) lists the three major threats to external validity: the reactivity of testing on X; the interaction of selection and X; and, other reactive factors (Emory, 1985:118). The first threat, reactivity of testing, deals with the sensitization of subjects through the pretest. This research used a separate (but similar) group for the pretest so this threat is effectively minimized. Concerning the interaction of selection, the population was randomly sampled through the requirement that only those members with a Social Security Number ending in "2" complete the survey. Thus, the threat to external validity through selection has also been effectively minimized. The last threat, other reactive factors, refers to those factors artificially induced in any research setting. For example, respondents may answer differently due to the knowledge that they are participating in a survey. Directions before each part of the questionnaire requested honest and thoughtful responses to all questions. As much as possible, this last threat to external validity was also minimized. Considering that these threats have been addressed and minimized, this research is likely to be externally valid for describing the population of TAC enlisted Supply personnel.

Identification of the Variables

The four predictor variables in this study are job satisfaction, organizational commitment, performance contin-

gent reward, and reward satisfaction. These variables are assessed to determine their influence on job performance.

Job Satisfaction. Overall job satisfaction is operationally defined as a composite of attitudes an individual feels toward his/her job (Landy and Trumbo, 1976:336). Job satisfaction is measured with the short form of the MSQ. The twenty questions relate whether the respondents are internally and externally satisfied with their jobs. All questions are combined to obtain a general indication of job satisfaction.

Organizational Commitment. Organizational commitment is operationally defined as the strength of an individual's identification with, and involvement in, his/her particular organization (Mowday and others, 1979:225). Answers to the nine questions are analyzed to provide a general indication of commitment to the organization. An individual who is committed to an organization accepts that organization's goals and values, is motivated to perform, and is more likely to remain a member than the non-committed employee (Mowday and others, 1979:236).

Performance Contingent Reward. Rewards are contingent when they are overtly given to an employee for a particular behavior the organization desires. To obtain an indication of performance contingent rewards, the employee is asked to rate the organization on its tendency to promote or externally reward by other means, those employees who make an extra effort to serve their customers. Questions 43-45 were

developed to ascertain, from the employees' viewpoint, whether customer service efforts are adequately externally rewarded by the organization.

Reward Satisfaction. Employees may reward themselves for their customer service efforts. An employee is internally rewarded when he/she feels a sense of accomplishment or suspects supervisory appreciation for their extra efforts to solve customer problems. The organization can either facilitate or detract from the ability of the employee to reward themselves through company policies and procedures. Questions 41-42 were developed to allow the respondents to rate their satisfaction with the internal rewards available to them.

Criterion Variable. The criterion variable of interest is individual job performance. Flores found that the customers of Base Supply were generally unhappy with the performance of customer service employees (Flores, 1990:71). This research uses the Perceived Self-Performance Measure to allow base supply employees to rate their own performance over the past six months. Responses to questions 36-40 are combined to obtain an overall indicator of performance.

Assumptions and Limitations

For statistical analysis the following assumptions must be made:

- a. The observations are drawn from normally distributed populations.

- b. The populations have equal variances.
- c. The observations are independent. The measurement of one can not affect the measurement of another.
- d. The measurement scales should be at least interval in nature so that arithmetic operations can be performed. (Emory, 1985:358)

This survey uses a Likert Scale to group respondents according to their answers on various work attitude and performance questions. Many behavioral scientists are using parametric procedures for ordinal data which "seems to approach interval scales in nature" (Emory, 1985:90). The intervals between the responses were equal in value with "verbal anchors" for the respondents to estimate distance between the scales. Thus, the assumption is made that the data can be treated as near-interval and parametric statistical tests are appropriate.

Statistical Analysis

Applying statistical tests between the variables under investigation provides the basis for addressing each of the three hypotheses.

Reliability. Each section of the survey is evaluated first for reliability. Reliability provides evidence that the researcher is using an instrument which is relatively free from random or unstable error. Additionally, reliable instruments can be used with confidence that transient and situational factors are not adversely affecting the results. "Reliable instruments are robust; they work well at different times under different conditions" (Emory, 1985:98). It

is important to establish reliability to ensure the researcher is using a measure which provides consistent results.

Correlation. To measure the relationship between two sets of variables, Pearson's Product Moment Coefficient of Correlation (r) is used. Pearson's r is "a measure of the strength of the linear relationship between two variables" (McClave and Benson, 1988:514). Pearson's r ranges from -1 to 1 with values close to 1 indicating a strong positive relationship, and values close to -1 indicating a strong negative relationship. Values of r near or equal to 0 imply little or no relationship between the variables under consideration.

Through Pearson's r , the predictor and criterion variables are analyzed to determine strength of association. Because past research has shown that work attitudes and performance are related, it is thought that strong correlations will be obtained through Pearson's r .

T-Test. T-test analysis compares the means between two groups to determine if they are significantly different. The SPSS-X t-test procedure is used to calculate the Student's t , degrees of freedom, and two-tailed probability (SPSS-X, 1986). The intent is to identify any significant difference between the work attitude or performance means of customer service and non-customer service base supply employees. The t-test enables the researcher to determine whether a difference between two means really exists or,

whether it is the result of random score fluctuations (McClave and Benson, 1988:387).

Multiple Regression. Multiple regression is a multivariate statistical technique which can be employed to predict values for a criterion variable from the values of numerous predictor variables. In this instance, performance is predicted from job satisfaction, organizational commitment, performance contingent reward, and reward satisfaction. Regression may also be used when the researcher wants to control confounding variables to analyze the contribution of other variables. "For example, one might wish to control the brand of a product, and the store in which it is bought in order to study the effects of price as an indicator of product quality" (Emory, 1985:397). Multiple regression is also used to support causal theories proposed by the researcher. This variation is known as path analysis. Here the predictor variables are "advanced a priori [sic]" according to their level of significance on the criterion variable (Emory, 1985:396-397).

The regression technique allows one to make a comparison of errors when predicting Y, when X is used to predict Y. The statistic to describe this relationship is r^2 . "It tells us by what proportion our predictions of one variable improve when we base those predictions on knowledge of the other variable" (Kidder and Judd, 1986:354). The statistic is given proportionally, ranging from 0 to 1. For r^2 to equal 0, the "best" predictions of Y based on X are no

better than our predictions without the knowledge of X. Conversely, r^2 will equal 1 only if our "best" predictions of Y, based on the knowledge of X, are perfect. Consequently, r^2 generally falls within the range of these two extremes (Kidder and Judd, 1986:354).

In multiple regression, two or more independent variables are used with the goal of improving the prediction of Y. Multiple regression models are written in the following form: $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k + e$. The dependent (criterion) variable, y, is a function of the independent variables x_1, x_2, \dots, x_k . β_0 is the constant used to improve the prediction of the criterion variable. The contribution of each independent variable is indicated by $\beta_1, \beta_2, \dots, \beta_k$. The weight (Beta) given to each independent variable is dependent upon its correlation with the criterion and the degree of correlation with the other pooled predictors (Steel, 1991). The random error term, e, makes the equation probabilistic instead of deterministic (McClave and Benson, 1988:556).

Using both the correlation and regression procedures, good predictor patterns can be determined. In the correlation procedure, researchers look for a predictor highly correlated with the criterion variable and having a low correlation with the other pooled predictors. In multiple regression, increases in r-squared due to the addition of predictor variables, account for greater explained variance in the criterion (Steel, 1991).

Since path analysis is used to investigate causation among the three hypotheses, a further discussion is offered. Behavioral scientists who want to bring about changes in behavior must first be able to identify the reasons or causes of the observed behavior. Correlation data, although valuable, does not in itself provide proof of causation. However, the researcher who has properly advanced a model based on knowledge, theoretical formulations and assumptions, and logical analysis can use covariations and correlations among variables to offer support for, or reject, the proposed model (Pedhazur, 1982:578-579).

Competing causal models may even be consistent with the same set of data. Pedhazur (1982) offers an example. Two competing models are offered: $X \rightarrow Y \rightarrow Z$; $X \leftarrow Y \rightarrow Z$. In the first model, X is proposed to affect Y, which in turn affects Z. For the second model, Y affects both X and Z. Both models may be consistent with correlations observed under the path analysis technique. "The decision as to which of them is more tenable rests not on the data but rather on the theory that generated the causal model in the first place" (Pedhazur, 1982:579).

Before discussing the proposed models or path diagrams, a distinction is made between exogenous and endogenous variables. An exogenous variable is one that possesses variability which is assumed to be outside of the causal model. Endogenous variables are those having variation which is theoretically explained by those variables (either

exogenous or endogenous) within the causal model. In a path diagram, exogenous variables are joined by a line with arrowheads on both ends. In this case, the researcher is proposing that neither variable is the cause of the other. Exogenous variables may also be described by a residual term, represented with a unidirectional line between the residual term "e" pointing to a variable not dependent on any other term within the model. The residual term "e" ". . . represents unmeasured variables, or variables not included in the system" (Pedhazur, 1982:585). To calculate "e," take the square root of 1 minus the correlation coefficient between the independent and dependent term for the residual being determined. Endogenous variables are joined by a line with an arrowhead on one end. The variable without the arrowhead is thought of as the cause (independent), whereas, the variable to which the arrowhead points is taken as the effect (dependent) (Pedhazur, 1982:581).

As previously mentioned, assumptions must be set forth and followed to properly use the path analysis technique.

The assumptions for path analysis are:

1. The relations among the variables in the model are linear, additive, and causal. Consequently, curvilinear, multiplicative, or interaction relations are excluded.
2. Each residual is not correlated with the variables that precede it in the model. In other words, variables not included and subsumed under residuals are assumed to be not correlated with the relevant variables.
3. There is a one way causal flow in the system. That is, reciprocal causation between variables is ruled out.
4. The variables are measured on an interval scale.

5. The variables are measured without error.
(Pedhazur, 1982:582)

Models for Analysis

Model 1. The literature review discussed in Chapter I offers various interpretations of the causal linkages between work attitudes and performance. The theory that job satisfaction causes performance has persisted since the Hawthorne Studies. However, researchers using strong statistical techniques (i.e., meta-analysis) have concluded only a slight to moderate positive relationship exists between the two variables (Petty and others, 1984; Iaffaldano and Muchinsky, 1985). Likewise, studies of organizational commitment, provide evidence of strong correlations between employee turnover and commitment, but offer only limited evidence that commitment causes performance (Mowday and others, 1979; Shore and Martin, 1989). Mottaz (1987) found satisfaction accounted for more variance in commitment than vice versa, but little other research has compared these two variables (Mottaz, 1987:551). Although the relationships among the three aforementioned variables are suspect, they continue to surface throughout the social science literature. Moreover, researchers and laymen alike, continue to believe that work attitudes are indicative of performance. Thus, the first model for testing proposes that either satisfaction alone causes performance, or causes commitment which in turn, causes performance.

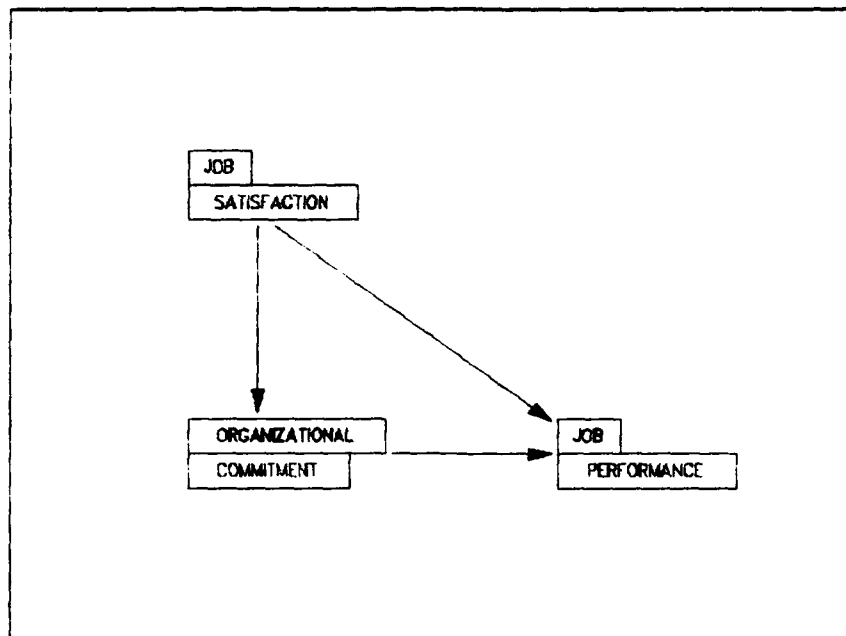


Figure 4. Satisfaction causes performance directly or is mediated by organizational commitment.

In Model 1, job satisfaction is proposed to affect organizational commitment and performance. Organizational commitment is hypothesized to affect performance. Both organizational commitment and performance are exogenous variables with residual path coefficients which are calculated using path analysis.

Model 2. Porter and Lawler (1967) proposed a reversal of the causal relationship between job satisfaction and performance. They suggested rewards link the two; others proposed various "moderating variables" connect the causal linkage between performance and satisfaction (Porter and Lawler, 1967; Lopez, 1982). Concerning organizational commitment, few researchers have proposed causation in the

commitment-performance relationship. Most likely, the unresolved satisfaction-performance issue has limited their tendency to do so. Shore and Martin (1989) report evidence exists which indicates commitment is moderately related to a long-term measure of performance.

In this model, performance is proposed to affect both satisfaction and commitment. Job satisfaction is believed to affect organizational commitment. In Model 2, organizational commitment and job satisfaction are exogenous variables with residual path coefficients which are calculated through the path analysis procedure.

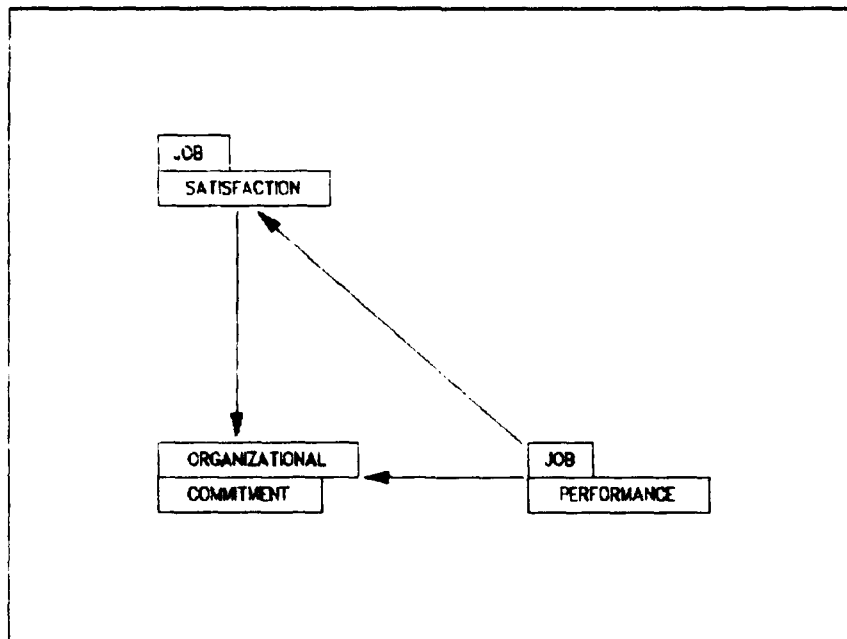


Figure 5. Performance causes satisfaction and organizational commitment.

Although Model 1 and Model 2 appear similar, they are vastly different. The arrowheads pointing away from performance in Model 2, indicate it is now the predictor variable. This causal theory then proposes that performance causes job satisfaction and commitment.

Model 3. Cherrington and others (1971) advanced the importance of performance contingent rewards in the satisfaction-performance relationship. They postulated that rewards, particularly ones offered for a specified level of performance, are the driving force affecting work attitudes and performance. Other researchers confirmed the power of rewards, including intrinsic (internal) rewards which employees give themselves for good performance (Jacobs and Solomon, 1977; Smith, 1984; Gupta, 1980). Mowday and others (1979) could not identify any studies in their analysis which tested the relationship between commitment and rewards but felt the issue was in need of exploration. "For example, what are the effects of high levels of organizational commitment on the impact of organizationally designed motivation and reward systems?" (Mowday and others, 1979:245). However, not enough theoretical research is available to imply whether rewards affect commitment or vice-versa. Thus, organizational commitment is deleted from Model 3.

Therefore, Model 3 seeks to observe the interaction between rewards, performance, and satisfaction. Rewards are observed for their direct effect on both performance and

satisfaction, while performance is observed for its direct effect on satisfaction.

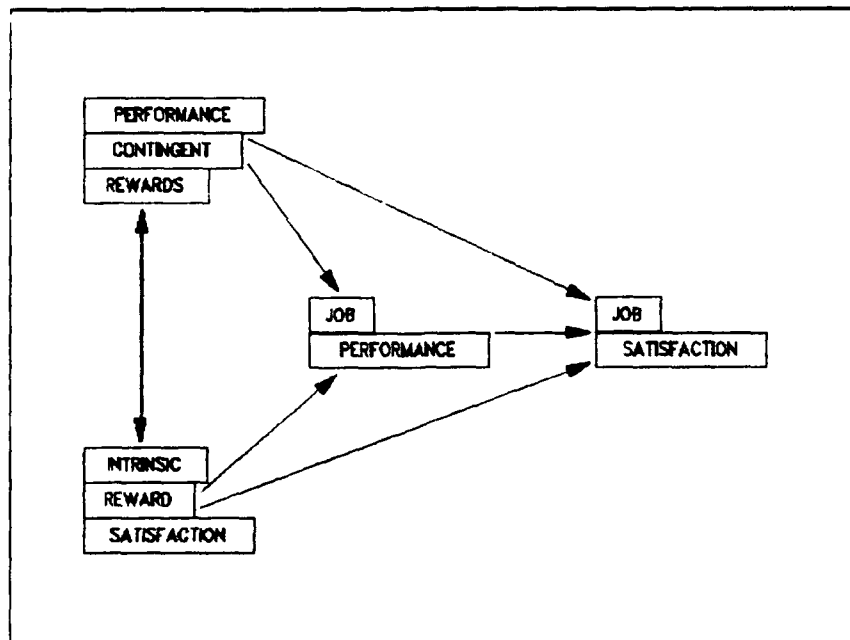


Figure 6. Rewards cause performance and job satisfaction.

Model 3 is an example of a four-variable model. Contingent rewards and intrinsic rewards are exogenous variables (one does not cause the other); both types of rewards are presumed to affect performance; and rewards and performance affect satisfaction. In this case, performance and job satisfaction are exogenous variables with residual path coefficients which are calculated through the path analysis procedure.

Two regression analyses are required to calculate the path coefficients for Model 3. Performance must first be

regressed on contingent and intrinsic rewards. Next, satisfaction is regressed on contingent rewards, intrinsic rewards, and performance.

Since the effect of rewards on commitment is not examined in Model 3, a multiple regression model using the SPSS-X multiple regression procedure is devised to include these variables. Although this is not an analysis of an established causal theory (path analysis is not used) the causal linkages under investigation are quite rational and were implied by Mowday and others (1979). Should these predictors explain a large amount of variation (i.e., a high r^2) in organization commitment, future research would be needed in the area before path analysis is properly used. Nonetheless, organizational commitment has already been proven to be an important work attitude with the potential of influencing (or being influenced by) job performance and possibly rewards. To best gauge the variation that the r^2 for commitment explains, two other multiple regression models are devised where performance and satisfaction are each entered as the criterion variable.

Hypothesis 1

Null Hypothesis 1. H₀1: The path coefficients between satisfaction, commitment, and performance in Model 1 are not significantly different from zero. (Statistical evidence

does not support that Supply personnel job satisfaction and organizational commitment levels cause their performance).

Alternate Hypothesis 1. Hal: The path coefficients between satisfaction, commitment, and performance in Model 1 are significantly different from zero. (Statistical evidence supports Supply personnel job satisfaction and organizational commitment levels cause their performance).

Statistical Test. Pearson's correlation between the predictor variables and the criterion variable will show strength of association between the variables. Model 1 offers the a priori causal reasoning for the variables under investigation; path analysis is used to decompose the correlation between the path(s).

Significance Level. A significant positive correlation ($p \leq .05$) between the variables is necessary to support the alternate hypothesis.

Decision Rule. Disconfirm the causal theory used to develop Model 1 should the direct or total effect coefficients be sufficiently close to zero to be assumed to have no effect.

Justification. If the variables are significantly correlated and path analysis supports the a priori reasoning proposed, job satisfaction and organizational commitment levels cause Supply Personnel performance.

Hypothesis 2

Null Hypothesis 2. Ho2: The path coefficients between performance, satisfaction and commitment in Model 2 are not significantly different from zero. (Statistical evidence does not support that Supply personnel performance causes their job satisfaction and organizational commitment levels).

Alternate Hypothesis 2. Ha2: The path coefficients between performance, satisfaction, and commitment in Model 2 are significantly different from zero. (Statistical evidence supports that Supply personnel performance causes their job satisfaction and organizational commitment levels).

Statistical Test. Pearson's correlation between the predictor variables and the criterion variable will show strength of association between the variables. Model 2 offers the a priori causal reasoning for the variables under investigation; path analysis is used to decompose the correlation between the path(s).

Significance Level. A significant positive correlation ($p \leq .05$) between the variables is necessary to support the alternate hypothesis.

Decision Rule. Disconfirm the causal theory used to develop Model 2 should the direct or total effect coefficients be sufficiently close to zero to be assumed to have no effect.

Justification. If the variables are significantly correlated and path analysis supports the a priori reasoning proposed, job satisfaction and organizational commitment levels cause Supply Personnel performance.

Hypothesis 3

Null Hypothesis 3. Ho3: The path coefficients between rewards, performance, and satisfaction in Model 3 are not significantly different from zero. (Statistical evidence does not support that rewards allocated to Supply personnel cause performance, which in turn causes job satisfaction).

Alternate Hypothesis 3. Ha3: The path coefficients between rewards, performance, and satisfaction in Model 3 are significantly different from zero. (Statistical evidence supports that rewards allocated to Supply personnel cause performance, which in turn causes their job satisfaction).

Statistical Test. Pearson's correlation between the predictor variables and the criterion variable will show strength of association between the variables. Model 3 offers the a priori causal reasoning for the variables under investigation; path analysis is used to decompose the correlation between the critical path(s).

Significance Level. A significant positive correlation ($p \leq .05$) between the variables is necessary to support the alternate hypothesis.

Decision Rule. Disconfirm the causal theory used to develop Model 3 should the direct or total effect coefficients be sufficiently close to zero to be assumed to have no effect.

Justification. If the variables are significantly correlated and path analysis supports the a priori reasoning proposed, job satisfaction and organizational commitment levels cause Supply Personnel performance.

Summary

This chapter described the specific research methods used in this study. Topics discussed include research and instrument design, population and sample characteristics, data collection and handling, validity of the instrument, identification and discussion of the variables, and the statistical tests and techniques which are used. Bivariate and multivariate analysis were discussed for use in testing the survey results for strength of association, significant differences, and causality among the variables. The outcome of this analysis is presented in Chapter III.

III. Results and Analysis

This chapter provides the results of the research and includes the analysis of those results. Topics discussed include the survey response rate, characteristics of the sampled population, and reliability of the survey instrument. A correlation analysis of the variables of interest is conducted and evidence of convergent and construct validity is presented. A t-test analysis is used to identify differences between the customer service and non-customer service employees. Multiple regression is used to determine the impact of demographic characteristics on work attitudes, rewards, and performance. Models 1 - 3 (Chapter II) are analyzed by path analysis to test each of the three hypotheses proposed for this research. Lastly, a revised model of rewards, work attitudes, and performance is proposed.

Survey Response Rate

As outlined in Chapter II, twenty surveys were sent to each of the eighteen TAC CONUS bases for a total distribution of 360 questionnaires. The goal was to measure 10% of the entire enlisted Base Supply population to obtain non-biased results through a wide dissemination of respondents. Of the 360 surveys mailed, 305 were returned, creating a response rate of 84.7 percent. Of the surveys returned, all but two were suitable for the demographic analysis. Up to

twenty additional responses were eliminated by the software, as appropriate to different analyses. Elimination of a response occurs when the respondent fails to answer a question with one of the given choices or answers a question twice. This resulted in an effective sample of 282 respondents; considered a large and robust sample upon which to perform an analysis.

Population and Sample Characteristics

Since the sample is large (N=303), comparing the population and sample demographic characteristics enable the researcher to obtain an estimate of how well the sample matches the population. The population and sample grades and percentages are given in Table 1 (Martin, 1991):

Table 1

Demographic Comparison - Population versus Sample Grade

<u>Grade</u>	<u>Population</u>	<u>%</u>	<u>Sample</u>	<u>%</u>
E1-E3	1450	29.7	59	19.5
E4	1446	29.7	106	35.0
E5	1135	23.3	75	24.8
E6	448	9.2	34	11.2
E7	288	5.9	21	6.9
E8	70	1.4	8	2.6
E9	37	0.8	---	0.0
Total	4874	100.00	303	100.00

Table 1 is interpreted as follows: the Base Supply population is adequately represented by the sample used in this research. Although the percentage of E1-E3 employees is ten percent lower in the sample than in the population, this is not believed severe enough to impact the analysis. Moreover, there are five percent more E4 employees in the sample which is an offset to the lower number of E1-E3 personnel. The sample is very representative for the remaining grades. The number of employees assigned to each base (by grade) is presented in Appendix C.

Question 3 (base of assignment) was used to ensure that responses were received from all continental TAC supply organizations. Twelve to twenty surveys were returned from each base. This equates to at least a 60 percent return rate from each TAC base.

The mean and standard deviation for Question 2 (Time in Service) and Question 5 (Time in Section) were calculated through the SPSS-X Reliability Procedure (SPSS-X, 1986). Results of this analysis are also included in Appendix C.

Reliability Analysis

As mentioned in Chapter II, the self-developed portion of the questionnaire was pre-tested, resulting in a Cronbach coefficient alpha of .67. The other sections of the survey were previously used and have been shown to have established reliability (Chapter II). In order to establish reliability

for the entire survey, each section was tested with the SPSS-X reliability procedure (SPSS-X, 1986):

Table 2
Reliability Coefficients for Variables of Interest

Question	Instrument	Variable(s)	Alpha	Cases
6-26	MSQ	Job Sat.	.91	291
27-35	OCQ	Org Comm.	.93	301
36-40	Perceived Self-Perform. Measure	Performance	.83	299
41-45	(self developed)	Reward Sat.	.78	292

The SPSS-X reliability procedure provides the mean and standard deviation for each question. The sample was initially analyzed as one group. For job satisfaction, a five-point scale was used to indicate whether the individual was very dissatisfied to very satisfied with a specific part of the job. Respondents were most satisfied with having the opportunity to do things for other people (mean=4.08; SD=.97). The job's steady employment was also very satisfying for the sample (mean=4.02; SD=.79). On the other hand, the method in which Air Force policies are put into practice, and the pay for the amount of work done, was least satisfying for the respondents (means=3.05, 3.04; SDs=1.1, 1.2).

For the Organizational Commitment Questionnaire, each item included a seven-point scale that ranged from strongly disagree to strongly agree. Participants were asked to

provide indications of how they felt about various aspects of their organization. Many moderately agreed that they were willing to put in a great deal of extra effort to help their organization be successful (mean=5.88; SD=1.38). However, most slightly disagreed to accepting any type job assignment in order to remain assigned to their current organization (mean=3.72; SD=1.93).

When using the Self Performance Measurement (seven-point scale) to rate their own performance, most workers moderately or strongly agreed that the quality of their own output was very high (mean=6.28; SD=.94). Nevertheless, fewer people indicated that they always got maximum output from their available resources, such as money, material, and personnel (mean=5.55; SD=1.37).

When responding to questions concerning intrinsic reward satisfaction, almost all moderately or strongly agreed that they felt a sense of accomplishment when they were able to successfully solve customer problems and complaints (mean=6.4; SD=.93). But, respondents only slightly agreed that they felt appreciated by their supervisors for any extra effort they made to solve their customers' problems (mean=5.29; SD=1.67).

Rewards for customer service effort are apparently not performance-contingent. Most respondents did not even slightly agree that their customer service efforts were a criterion for promotion (mean=4.56; SD=1.8). Moreover, the majority of respondents slightly disagreed that their orga-

nization had established a good reward system for their customer service efforts (mean=3.6; SD=1.9).

Although the above mentioned questions were highlighted for particularly low or high means, many other questions from the survey give valuable information about specific variables of interest. Appendix D provides complete means, standard deviations and the number of cases for each survey question.

Correlation Analysis

Linear relationships between work attitudes and job performance were calculated using the Pearson product-moment coefficient of correlation. The strongest correlations were between job satisfaction and organizational commitment (.69); job satisfaction and intrinsic reward satisfaction (.59); organizational commitment and performance contingent reward (.52); and, organizational commitment and performance (.50). Relatively weak to modest correlations were found between performance and performance contingent rewards (.24); intrinsic reward satisfaction and performance (.36); and, job satisfaction and performance (.38).

A strong relationship is considered to exist between variables with Pearson coefficients of .50 or greater. For example, in this survey, if the respondent reported high job satisfaction levels, he/she generally reported high organizational commitment levels. Conversely, weak correlations

between two variables indicate little or no relationship between the variables of interest. For this sample, respondents who rated their performance high were equally likely to rate their satisfaction with performance contingent rewards as low or high. Table 3 gives the intercorrelations among the variables of interest.

Table 3

Pearson Correlation Coefficients Between
Work Attitudes and Performance

	Job Satis.	Organ. Comm.	Perform.	Intrinsic Reward Sat.	Perf Cont. Reward
Job Satis.	1.00				
Organ. Comm.	.68	1.00			
Perform.	.38	.50	1.00		
Intrinsic Rew Sat.	.59	.50	.36	1.00	
Perf Cont. Reward	.49	.52	.24	.48	1.00

Note: All values were significant at $p < .01$.

One caution about correlation is in order at this point. If two variables are strongly correlated (such as satisfaction and commitment), one can not infer a causal relationship between them. The only safe inference is that a linear trend exists between the two variables (McClave and Benson, 1988:515-516). However, a strong correlation enhances the possibility that a causal relationship may exist.

In other words, causality would not be possible if there were no relationship between the variables.

Since work attitudes, satisfaction with rewards, and indicators of performance have been shown to relate, each variable was expected to significantly correlate with the other in the TAC sample. Stated differently, although each variable measures a different affective response, these responses should be closely correlated with each other because they result from the same situational and personal factors. All correlations among the variables in this study are statistically significant. Therefore, sufficient evidence exists for convergent validity in the instrument.

Construct validity must be ascertained when a researcher develops a new instrument intended to measure a specific variable of interest. For this thesis, five questions were author-developed with the intent of gaining an indication of intrinsic and extrinsic reward satisfaction. The MSQ, used in this study to determine job satisfaction, provides a general indication of intrinsic and extrinsic job satisfaction. The correlation between satisfaction (measured by the MSQ) and intrinsic reward satisfaction (measured by the author-developed questions) was strong (.59). Also, a sound correlation (.49) between satisfaction and performance contingent rewards was found. Therefore, evidence of construct validity is provided through these results.

The demographic variables were correlated with each other and with the work attitudes and performance indica-

tors. A strong correlation existed between Grade and Time In Service ($r=.88$). However, this correlation exists due to the collinearity which occurs if one variable is closely dependent upon the others. In this case, one criterion for promotion is time in service. Thus, it is not surprising that these two variables are highly correlated. Further, only one of these variables should be used in a multiple regression analysis since they clearly measure the same attribute.

Other strong correlations were not found among the demographic characteristics. Although not specifically studied in this research, a weak positive correlation was noted between performance and grade ($r=.24$) and performance and time in service ($r=.23$). Since the respondents rated their own performance, individuals who are "careerists" may consciously or unconsciously inflate their self evaluations to internally substantiate their job positions. On the other hand, these older (middle phase) employees may actually be better performers, as has been proposed by proponents of the career stage theory (Kacmar and Ferris, 1989:202).

A slight negative correlation existed between section and intrinsic reward satisfaction ($r=-.14$). Here, it is likely that those individuals not working in customer service positions (or positions which interact regularly with individuals outside of Supply) naturally do not gain a sense of accomplishment or a sense of supervisor appreciation for their customer service efforts. What is interesting is that

there is a slight negative correlation existing between organizational commitment and section ($r = -.12$). One possible explanation for these negative correlations is that they may have been an artifact of instrument coding since section is really a nominal variable. See Appendix E for all correlation coefficient results.

T-Test Analysis

T-tests were conducted to determine if significant differences existed between those employees assigned to customer service positions and those employees not assigned to customer service positions. The t-test is used to determine if the difference between each group's mean score for a particular variable is large enough to be considered a true difference or the result of random score fluctuations (McClave and Benson, 1988:436).

Survey question 4 asked respondents to indicate their assigned section. Choices 1-9 were the units which Flores indicated were the primary customer service offices within supply (Flores, 1990). Item 10, "Other," was offered for respondents who were assigned to sections not believed to be customer service positions. Participants were asked to indicate a specific section if it was under the "other" category. From those who specified their section, the following offices entailed the non-customer service units: Inventory; Fuels; Procedures and Analysis; Document Control;

Storage and Issue; Receiving; Pickup and Delivery; Inspection; Material Storage and Distribution; Bench Stock; Research; Computer Operations; Mobility; Funds Management; Supply Readiness Center; Management and Systems Branch; Individual Equipment Unit; and the Orderly Room.

The employees were grouped in either Group 1 (customer service) or Group 2 (others). Using the SPSS-X t-test procedure (SPSS-X, 1986), the work attitudes and performance ratings for the two groups were compared. Table 4 gives the highlights; Appendix F gives all of the results.

Table 4

Comparison of Work Attitudes and Performance for Customer Service and Non-Customer Service Employees

Variable	N Grp 1	N Grp 2	T	Deg. of Freedom	2-Tail Prob.
Satisfaction	123	168	1.27	289	.20
Commitment	130	171	1.03	299	.305
Performance	129	170	-0.12	297	.903
Intrinsic Satisfaction	128	172	2.15	298	.033*
Performance- Contingent	128	166	.71	292	.478

* Indicates a statistically significant difference at the $p < .05$ level.

The groups' variable scores were very similar except for one measure: intrinsic reward satisfaction. A t-statistic greater than 2.0 occurs less than 5 percent of the

time. Thus, statisticians would suggest that the null hypothesis be rejected (Kidder and Judd, 1986:366). There is a significant difference between these two groups in their assessment of intrinsic reward satisfaction. Several explanations for this difference are possible. First, the employees in Group 2 do not consider interaction with customers as a major function of their job, so they do not gain a great deal of internal satisfaction from those instances when they do provide assistance to customers of Supply. Second, the supervisors of Group 2 employees do not consider interaction with customers as a major function of their subordinates' job. Consequently, they do not convey an appreciation for any customer service efforts which are provided. Third, some Group 2 employees probably chose "non-applicable" (the middle value) for the questions dealing with customer service, and this may have led to the lower overall mean score for Group 2 employees. (Note that this is an accurate response for most of these employees.)

This t-test provides a valuable insight into those respondents considered non-customer service employees. Apparently, Group 2 employees consider customer service at least a minor part of their job. If not, the t-statistic would have been much higher than 2.15. It is suspected that almost all Supply personnel feel they are at least partially responsible for handling customer problems and concerns--even if their organization and supervisors feel differently!

Multiple Regression Analysis

The Regression Procedure in SPSS-X allows for many variations when building models to test relationships among variables. Options allow one to force the variables into the equation or let the computer program only bring in those variables which are statistically significant. A hierarchal model allows the researcher to combine the demographic characteristics with the attitudinal variables in order to examine the independent contribution to the prediction of the criteria (Steel, 1991). This method allows one to determine the affect (if any) of demographic characteristics on employee work attitudes and performance.

The demographic factors, grade and section, were provided by each participant. The intent was to determine if these factors had any combined affect on the criterion (dependent) variable. These personal factors were first forced into the regression equation with the "Enter" command. Next, each of the predictor (independent) variables were "pooled" and added one at a time with the "Forward" command. "At each step, the variable with the smallest probability-of-F value is entered if the value is smaller than the entry criterion, PIN (.05), and if the variable passes the tolerance test" (SPSS-X, 1986:666). This method makes it apparent which predictor variables best describe the criterion variable under investigation.

Good predictor patterns can be determined by using both the correlation and regression procedures. In the correlation procedure, researchers look for a predictor highly correlated with the criterion variable with a low correlation to the other pooled predictors. In multiple regression, increases in r-squared are due to the addition of predictor variables which account for greater explained variance in the criterion (Steel, 1991).

Using the hierarchal modeling technique, three different multiple regression models were designed. In the first model, performance was loaded as the dependent variable (Appendix G). Of the demographic variables forced to enter, grade was significant ($F=10.6$, Sig $F<.01$) while section was not ($F=.004$). Organizational commitment entered next and appeared to have a definite effect on performance ($F=45$, sig $F<.001$). Intrinsic reward satisfaction was the last variable to enter and is judged to slightly effect performance ($F=5.8$, Sig $F<.05$). Variables which did not enter against performance include job satisfaction and performance contingent rewards. Neither of these independent variables apparently significantly effect Performance. The R^2 for this model was .28. This is considered somewhat low, leading one to interpret that the independent variables in the model do not explain much of the variance in performance.

In the second multiple regression model, job satisfaction is the dependent, or criterion, variable (Appendix H). Now the analysis deals with which of the demographic and

attitudinal variables have a significant effect on job satisfaction. Neither section nor grade were significant ($F=.281$, $F=1.4$); indicating demographic characteristics have little effect on satisfaction. Conversely, organizational commitment had a very significant effect on satisfaction ($F=88.8$, $\text{Sig } F<.001$), as does intrinsic reward satisfaction ($F=39$, $\text{Sig } F<.001$). Performance contingent rewards have only a slight effect on satisfaction ($F=3.9$, $\text{Sig } F<.05$). Performance did not enter into the equation, ($F=.03$), leaving its effect on job satisfaction highly questionable. The R^2 of .55 in this model indicates that over half of the variance in job satisfaction is explained by the predictor variables in this equation.

In the third hierarchal model built, the criterion variable was organizational commitment (Appendix I). As in the last model, neither demographic factor significantly influenced commitment. Job satisfaction had an even stronger effect on commitment, than commitment had on it ($F=97$, $\text{Sig } F<.001$). Moreover, both performance and performance contingent rewards had a substantial impact on organizational commitment ($F=33$ and $F=24$, both $\text{Sig } F<.001$).

Of the attitudinal variables, only intrinsic reward satisfaction had no effect on Commitment ($F=.13$). The R^2 (.57) was the largest obtained in the three hierarchal models, indicating that the variables in this research explain the greatest variance in organizational commitment when compared with any other criterion. It is obvious

however, that other variables exist which, if captured, would improve the R^2 's for each of the criteria.

Path Analysis

Asher (1973) describes path analysis as a technique used to estimate the magnitude of relationships between variables, which allows one to examine the validity of the underlying causal processes (Asher, 1973:29). As described in Chapter II, path analysis is used to test an a priori model previously proposed by the researcher. To properly employ this technique, the proposed model should always be based on past research which has investigated the causal relationships being proposed.

Although path analysis is similar to ordinary regression analysis, an important distinction exists between the two approaches (Pedhazur, 1982:587). In ordinary regression analysis, a dependent variable is regressed in a single analysis on all the independent variables under consideration. Path analysis allows for more than one regression analysis. The dependent variable is regressed against each of the independent variables that the causal model proposes. Pedhazur (1982) clarifies the importance of this distinction:

One of the advantages of path analysis is that it affords the decomposition of correlations among variables, thereby enhancing the interpretation of relations as well as the pattern of the effects of one variable on another. (Pedhazur, 1982: 588)

In path analysis, a correlation coefficient can be separated into four components: Direct Effect (DE); Indirect Effect (IE); Unanalyzed (U) because of correlated exogenous variables; and, Spurious (S) due to common causes (or sharing of the same variable). The total effect is found by combining the direct and indirect effects (Pedhazur, 1982:589).

Model 1 Analysis. For Model 1 the following annotations and terminology are used. Job satisfaction is labeled variable 1; organizational commitment is variable 2; and performance is variable 3. The path coefficients are designated by p followed by the dependent and then the independent variable. Asher (1973) prefers Land's definition of a path coefficient which "measures the fraction of the standard deviation of the endogenous variable. . . for which the designated variable is directly responsible" (Asher, 1973:44). An error coefficient is designated by the small letter "e" followed by the number of the associated dependent variable. An error coefficient gives the amount of variation in the dependent variable not explained by the predictors in the model. Model 1 is redrawn below with the applicable path coefficients inserted between the variables.

In the conventional regression analysis, b's (unstandardized regression coefficients) are computed and applied to the X's (independent variables) in the equation. In path analysis, the raw scores of X and Y are converted to stan-

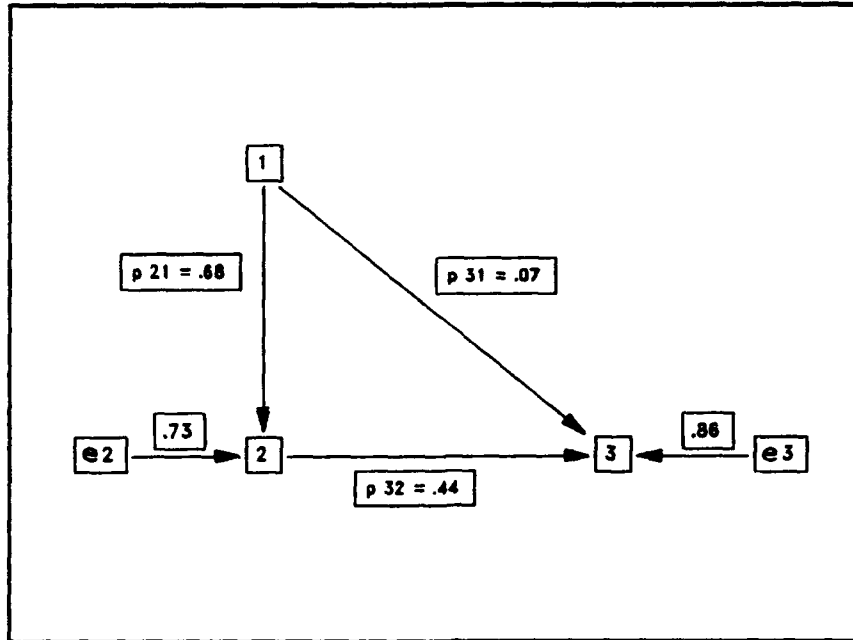


Figure 7. Model 1 with path and error coefficients.

dardized or z scores. Then, the standardized regression coefficient (Beta), designated by β , is calculated and applied to z's in the equation. Thus, β is defined as the expected change in Y associated with the change in one standard deviation in X (Pedhazur, 1982:53).

Looking at Model 1, the direct effect of variable 1 on 3 is given by p_{31} . Additionally, variable 1 affects variable 2, which then affects variable 3. This route is the indirect effect of 1 on 3 as mediated by 2 (given by $p_{21}p_{32}$). The correlation coefficient (pearson's r) for job satisfaction's effect on performance is labelled r_{13} . Thus, r_{13} is broken down into two parts; the DE of 1 on 3 and the IE of 1 on 3 through 2. The correlation coefficient for

organizational commitment and performance can also be decomposed. The DE of 2 on 3 is p_{32} ; the remainder of the effect of 2 on 3 is spurious (they share the same variable-job satisfaction) which is indicated by $p_{31}p_{21}$ or $r_{23}-p_{32}$.

The equations for Model 1 are (Pedhazur, 1983:594):

$$z_1 = e_1 \quad (1)$$

$$z_2 = p_{21}z_1 + e_2 \quad (2)$$

$$z_3 = p_{31}z_1 + p_{32}z_2 + e_3 \quad (3)$$

The path coefficients are then calculated accordingly:

$$p_{21} = \beta_{21} = r_{21} = .68 \quad (4)$$

The path between job satisfaction and organizational commitment is an example of one independent variable's effect on one dependent variable.

Next, the two independents are regressed on each dependent:

$$\beta_{31.2} = r_{31} - (r_{32})(r_{12}) / 1 - r_{12}^2 \quad (5)$$

$$\beta_{31.2} = (.38) - (.50)(.68) / 1 - (.68)^2$$

$$\beta_{31.2} = .38 - .34 / 1 - .4624$$

$$\beta_{31.2} = .04 / .5376 = .0744$$

$$\beta_{31.2} = p_{31} = .0744$$

$$\beta_{32.1} = r_{32} - (r_{31})(r_{12}) / 1 - r_{12}^2 \quad (6)$$

$$\beta_{32.1} = (.50) - (.38)(.68) / 1 - (.68)^2$$

$$\beta_{32.1} = .50 - .2584 / .5376$$

$$\beta_{32.1} = .2416 / .5376 = .4494$$

$$\beta_{32.1} = p_{32} = .4494$$

The path coefficient for e_2 to variable 2 is determined:

$$e_2 = \text{sqr root of } 1 - r_{12}^2 \quad (7)$$

$$e_2 = .733$$

Likewise, the path coefficient for e_3 to variable 3:

$$e_3 = \text{sqr root of } 1 - R_{3.12}^2 \quad (8)$$

$$R_{3.12}^2 = r_{31}^2 + r_{32}^2 - 2(r_{31})(r_{32})(r_{12}) / 1 - r_{12}^2$$

$$R_{3.12}^2 = (.38)^2 + (.50)^2 - 2(.38)(.50)(.68) / 1 - (.68)^2$$

$$R_{3.12}^2 = .253$$

$$e_3 = \text{sqr root of } 1 - .253$$

$$e_3 = .864$$

Decomposition of Model 1 Correlations. Since there are no intervening variables between 1 and 2, job satisfaction can have only a direct effect on organizational commitment. The equation for reproducing r_{12} (Σ or the "sum of") is:

$$r_{12} = 1/N \Sigma z_1 z_2 = 1/N \Sigma z_1 (p_{21} z_1) = p_{21} = .68 \quad (9)$$

Thus, the total effect of 1 on 2 is equal to $r_{12} = .68$.

In the case of r_{13} , organizational commitment intervenes between job satisfaction and performance:

$$r_{13} = 1/N \Sigma z_1 z_3 = 1/N \Sigma z_1 (p_{31} z_1 + p_{32} z_2) = p_{31} + p_{32} r_{12} \quad (10)$$

Whereas $r_{12} = p_{21}$ (see Eq 9),

$$r_{13} = p_{31} + (p_{32})(p_{21})$$

$$r_{13} = .0744 \text{ (DE)} + (.4494)(.68) \text{ (IE)}$$

$$r_{13} = .07 \text{ (DE)} + .31 \text{ (IE)} = .38$$

Hence, job satisfaction is shown to have only a slight direct effect (.07) on performance. Moreover, the large indirect effect (.31) of job satisfaction on performance is attributed to organizational commitment.

To decompose r_{23} , a similar procedure is followed:

$$r_{23} = 1/N \sum z_2 z_3 = 1/N \sum z_2 (p_{31} z_1 + p_{32} z_2) = p_{31} r_{12} + p_{32} \quad (11)$$

Whereas $r_{12} = p_{21}$ (see Eq 9),

$$r_{23} = (p_{31})(p_{21}) + p_{32}$$

$$r_{23} = (.0744)(.68) + .4494$$

$$r_{23} = .0506 \text{ (S)} + .4494 \text{ (DE)}$$

$$r_{23} = .50$$

In this case, organizational commitment has a strong direct effect (.44) on performance. A small spurious component (.05) exists due to the common cause between the variables (job satisfaction).

To summarize the path analysis for Model 1, the correlations among the variables (r_{13} and r_{23}) were reproduced using their path coefficients. The ability to reproduce R (the correlation matrix), using the path coefficients, is one factor considered when assessing the validity of a causal model. However, Pedhazur (1982) warns:

It is therefore very important to recognize that in just identified, or exactly identified, causal models it is possible to reproduce R, regardless of how ques-

tionable, or even bizarre, the causal model may be on substantive or logical grounds. (Pedhazur, 1982: 596)

Model 1 is an example of a just identified model. The number of equations are equal to the number of parameters being estimated. For each equation, a unique solution can be found. Therefore, the researcher must consider the basis for causality postulated in the proposed model before coming to a determination of validity of that model.

Model 2 Analysis. Model 2, which is used to test the second hypothesis, reversed the causal relationship between job satisfaction and performance. Performance was proposed to cause organizational commitment, rather than vice-versa as in Model 1. Also, job satisfaction is proposed to have an affect on organizational commitment. As in Model 1, job satisfaction is variable 1, organizational commitment is variable 2, and performance is variable 3. Note that the change in direction between the arrows indicates a change in dependent variables under investigation in this model.

The equations for Model 2 are (Pedhazur, 1982:597):

$$z_3 = e_3 \quad (12)$$

$$z_1 = p_{13}z_3 + e_1 \quad (13)$$

$$z_2 = p_{23}z_3 + p_{21}z_1 + e_2 \quad (14)$$

The path coefficients for Model 2 are calculated:

$$p_{13} = \beta_{13} = r_{13} = .38 \quad (15)$$

The path between job satisfaction and performance is an example of one independent variable's affect on one dependent variable.

The two independents are regressed on each dependent:

$$p_{23} = \beta_{23.1} = r_{23} - (r_{21})(r_{13}) / 1 - r_{13}^2 \quad (16)$$

$$p_{23} = (.50) - (.68)(.38) / 1 - (.38)^2$$

$$p_{23} = .2824$$

$$p_{21} = \beta_{32.1} = r_{21} - (r_{23})(r_{13}) / 1 - r_{13}^2 \quad (17)$$

$$p_{21} = (.68) - (.50)(.38) / 1 - (.38)^2$$

$$p_{21} = .5727$$

The path coefficient for e_1 to variable 1 is:

$$e_1 = \text{sqr root of } 1 - r_{13}^2 \quad (18)$$

$$e_1 = .925$$

Likewise, the path coefficient for e_2 to variable 2:

$$e_2 = \text{sqr root of } 1 - R_{2.13}^2 \quad (19)$$

$$R_{2.13}^2 = r_{21}^2 + r_{23}^2 - 2(r_{21})(r_{23})(r_{13}) / 1 - r_{13}^2$$

$$R_{2.13}^2 = (.68)^2 + (.50)^2 - 2(.68)(.50)(.38) / 1 - (.38)^2$$

$$R_{2.13}^2 = .531$$

$$e_2 = \text{sqr root of } 1 - .531$$

$$e_2 = .469$$

Model 2 is redrawn with the path and error coefficients inserted:

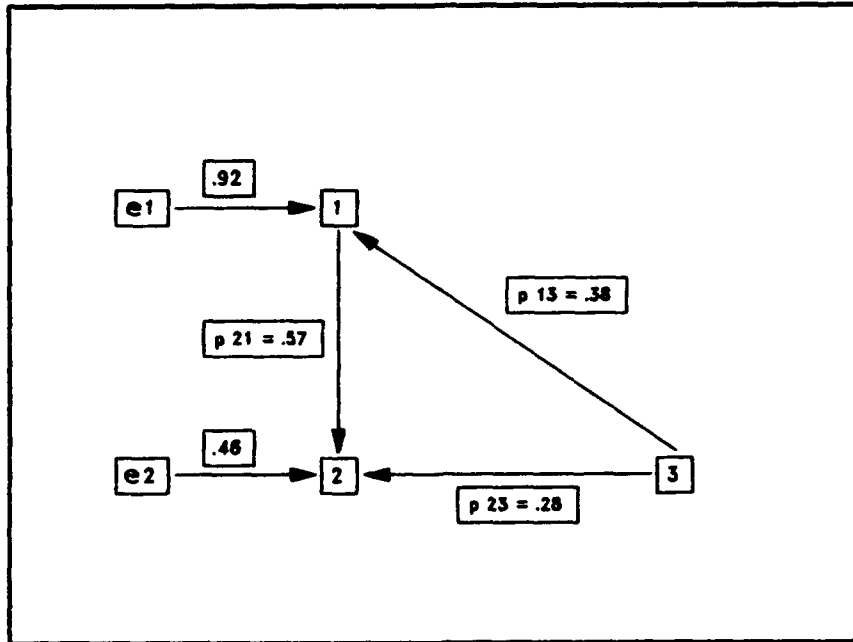


Figure 8. Model 2 with path and error coefficients.

Decomposition of Model 2 Correlations. Since there are no intervening variables between 1 and 3, performance can have only a direct effect on job satisfaction. To reproduce r_{13} , the following equation is used:

$$r_{13} = 1/N \sum z_3 z_1 = 1/N \sum z_3 (p_{13} z_3) = p_{13} = .38 \quad (20)$$

Thus, the direct effect, which equals the total effect of 3 on 1, is equivalent to $r_{13} = .38$.

In the case of r_{23} , job satisfaction intervenes between performance and organizational commitment. Therefore:

$$r_{23} = 1/N \sum z_3 z_2 = 1/n \sum z_3 (p_{23} z_3 + p_{21} z_1) = p_{23} + p_{21} r_{13} \quad (21)$$

Whereas $r_{13} = p_{13}$ (see Eq 20),

$$r_{23} = p_{23} + (p_{21})(p_{13}) \quad (22)$$

$$r_{23} = .2824 + (.5727)(.38)$$

$$r_{23} = .28 \text{ (DE)} + (.22) \text{ (IE)} = .50$$

Hence, performance is shown to have a moderate DE (.28) on organizational commitment. Moreover, the moderate indirect effect (.22) of performance on organizational commitment is attributed to job satisfaction.

To decompose r_{12} , a similar procedure is followed:

$$r_{12} = 1/NEz_1z_2 = 1/NEz_1(p_{23}z_3 + p_{21}z_1) = p_{23}r_{13} + p_{21} \quad (23)$$

Whereas $r_{13} = p_{13}$ (see Eq 20),

$$r_{12} = (p_{23})(p_{13}) + p_{21} \quad (24)$$

$$r_{12} = (.2824)(.38) + .5727$$

$$r_{12} = .1073 \text{ (S)} + .5727 \text{ (DE)}$$

$$r_{12} = .68$$

In this model, job satisfaction has a strong direct effect (.57) on organizational commitment. A weak (.1073) spurious component is also found due to the fact both variables share a common cause--performance.

Model 3 Analysis. In Model 3, rewards are entered into the analysis to test their causal effect on performance and job satisfaction. Intrinsic and performance contingent rewards are proposed to affect performance, which in turn, affects job satisfaction. Additionally, it is suggested that both types of rewards affect job satisfaction. Intrinsic

insic and performance contingent rewards are exogenous variables as indicated by the darkened line with arrowheads on both ends. Organizational commitment is deleted from Model 3 due to a lack of research implying a causal relationship between it and rewards. In this model, performance contingent reward is variable 1, intrinsic reward is variable 2, performance is variable 3, and job satisfaction is variable 4.

Since Model 3 is a four variable model, the manual calculations of the standardized regression coefficients (β) are tedious and confusing. Thus, the path coefficients are derived through the application of SPSS-X regression procedure (SPSS-x, 1986). The appropriate coefficients for this analysis are listed under the "Beta" column in the section labeled "Variables in the Equation". See Appendix J (performance regressed on both reward variables) and Appendix K (Satisfaction regressed on the three independent variables) to view both of the multiple regression analyses for Model 3. From Appendix J and K, the path coefficients are found for Model 3:

$$\beta_{31.2} = p_{31} = .10$$

$$\beta_{32.1} = p_{32} = .30$$

$$\beta_{41.23} = p_{41} = .25$$

$$\beta_{42.13} = p_{42} = .41$$

$$\beta_{43.12} = p_{43} = .15$$

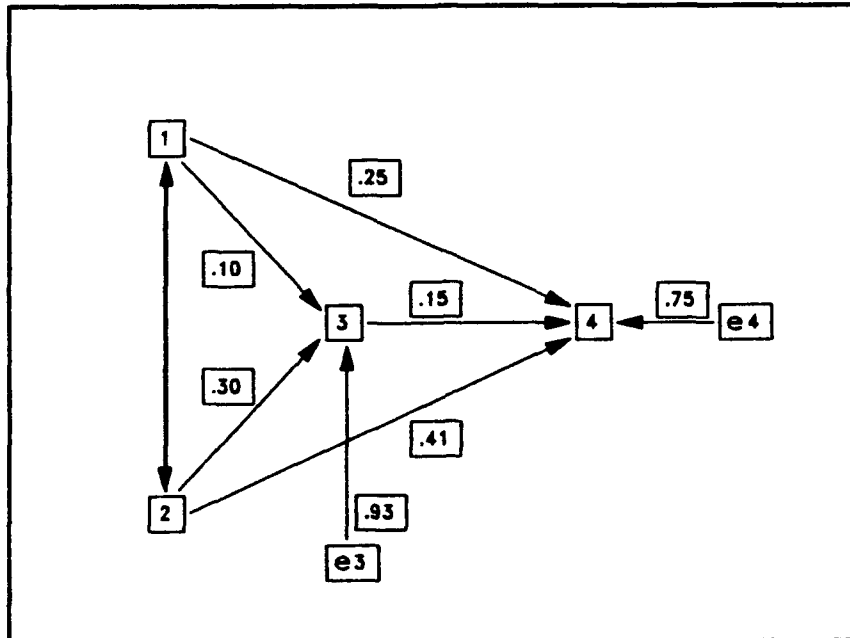


Figure 9. Model 3 with path and error coefficients.

The residual or error coefficients for the two dependent variables in Model 3, are also calculated from information provided in the SPSS-X multiple regression output. To find the residual coefficient, take the square root of $1 - r^2$ for each multiple regression output (Appendix J & K). The error coefficient for performance:

$$e_3 = \text{sqr root of } 1 - R_{3.12}^2 \quad (25)$$

$$e_3 = \text{sqr root of } 1 - (.13329)$$

$$e_3 = \text{sqr root of } .86671$$

$$e_3 = .93$$

Similarly, the residual coefficient for satisfaction:

$$e_4 = \text{sqr root of } 1 - R_{4.123}^2 \quad (26)$$

$$e_1 = \text{sqr root of } 1 - .42941$$

$$e_1 = \text{sqr root of } .57059 = .75$$

Decomposition of Model 3 Correlations. Pedhazur (1982)

offers the method used to decompose correlations in a four variable model (Pedhazur, 1982:602). Because intrinsic and performance contingent rewards are exogenous variables, r_{12} remains unanalyzed in this model. However, the equations to reproduce the endogenous variables are:

$$z_3 = p_{31}z_1 + p_{32}z_2 + e_3 \quad (27)$$

$$z_4 = p_{41}z_1 + p_{42}z_2 + p_{43}z_3 + e_4 \quad (28)$$

Since r_{12} is unanalyzed, r_{13} is reproduced first:

$$r_{13} = 1/N\sum z_1 z_3 = 1/N\sum z_1 (p_{31}z_1 + p_{32}z_2) \quad (29)$$

$$r_{13} = p_{31} + p_{32}r_{12} \quad (30)$$

$$r_{13} = .10 \text{ (DE)} + (.30)(.48)$$

$$r_{13} = .10 \text{ (DE)} + (.14) \text{ (U)} = .24$$

In this case, r_{13} is decomposed into two parts: the direct effect of performance contingent rewards on performance (.10) and an unanalyzed component (.144) because of the two exogenous variables. To reproduce r_{13} , the following equation is used:

$$r_{23} = 1/N\sum z_2 z_3 = 1/N\sum z_2 (p_{31}z_1 + p_{32}z_2) \quad (31)$$

$$r_{23} = p_{31}r_{12} + p_{32} \quad (32)$$

$$r_{23} = (.10)(.48) + .30$$

$$r_{23} = .04 \text{ (U)} + .30 \text{ (DE)} = .34$$

The direct effect of intrinsic rewards on performance is moderately strong (.30). Only .04 of the correlation between performance and intrinsic rewards remains unanalyzed due to the correlation between intrinsic reward and performance contingent rewards (exogenous variables).

The correlation between satisfaction and performance contingent rewards (r_{14}) is reproduced as follows:

$$r_{14} = 1/N \sum z_1 z_4 = 1/N \sum z_1 (p_{41} z_1 + p_{42} z_2 + p_{43} z_3) \quad (33)$$

$$r_{14} = p_{41} + p_{42} r_{12} + p_{43} r_{13} \quad (34)$$

Whereas $r_{13} = p_{31} + p_{32} r_{12}$ (see Eq 30),

$$r_{14} = p_{41} + p_{42} r_{12} + p_{43} (p_{31} + p_{32} r_{12}) \quad (35)$$

$$r_{14} = p_{41} + p_{42} r_{12} + p_{43} p_{31} + p_{43} p_{32} r_{12}$$

$$r_{14} = .25 + (.41)(.48) + (.15)(.10) + (.15)(.3)(.48)$$

$$r_{14} = .25 \text{ (DE)} + (.1968) \text{ (U)} + (.015) \text{ (IE)} + (.02) \text{ (U)}$$

$$r_{14} = .48$$

The direct effect of performance contingent rewards on job satisfaction is .25. The indirect effect of performance is small at .015. The total effect (DE + IE) of performance contingent rewards on satisfaction is .266, which is primarily explained through the direct effect. The unanalyzed portion of the reproduced correlation is .21 and is unexplained due to the exogenous variables.

Next, r_{24} is reproduced to decompose the correlation between job satisfaction and intrinsic rewards:

$$r_{24} = 1/N\sum z_2 z_4 = 1/N\sum z_2 (p_{41}z_1 + p_{42}z_2 + p_{43}z_3) \quad (36)$$

$$r_{24} = p_{41}r_{12} + p_{42} + p_{43}r_{23}$$

Whereas $r_{23} = p_{31}r_{12} + p_{32}$ (Eq 30),

$$r_{24} = p_{41}r_{12} + p_{42} + p_{43}(p_{31}r_{12} + p_{32}) \quad (37)$$

$$r_{24} = p_{41}r_{12} + p_{42} + p_{43}p_{31}r_{12} + p_{43}p_{32}$$

$$r_{24} = (.25)(.48) + .41 + (.15)(.10)(.48) + (.15)(.30)$$

$$r_{24} = .12 (U) + .41 (DE) + .0072 (U) + .045 (IE) = .58$$

A large direct effect (.41) is found between intrinsic reward and job satisfaction with a only slight indirect effect (.045) attributed to the path going from intrinsic reward through performance to satisfaction. The exogenous variables are not analyzed; accounting for the remaining correlation of .127 between intrinsic reward and satisfaction.

The last coefficient (r_{34}) in Model 3 is:

$$r_{34} = 1/N\sum z_3 z_4 = 1/N\sum z_3 (p_{41}z_1 + p_{42}z_2 + p_{43}z_3) \quad (38)$$

$$r_{34} = p_{41}r_{13} + p_{42}r_{23} + p_{43}$$

Whereas $r_{13} = p_{31} + p_{32}r_{12}$ (Eq 30) and $r_{23} = p_{31}r_{12} + p_{32}$ (Eq 32), r_{34} is decomposed in the following manner:

$$r_{34} = p_{41}(p_{31} + p_{32}r_{12}) + p_{42}(p_{31}r_{12} + p_{32}) + p_{43} \quad (39)$$

$$r_{34} = p_{41}p_{31} + p_{41}p_{32}r_{12} + p_{42}p_{31}r_{12} + p_{42}p_{32} + p_{43}$$

$$r_{34} = (.25)(.10) + (.25)(.3)(.48) + (.41)(.30) + .15$$

$$r_{34} = .025 (S) + .036 (S) + .123 (S) + .15 (DE)$$

$$r_{34} = .33$$

Thus, the direct effect of performance on satisfaction is moderately weak (.15). The rest of the correlation (.184) is due to spurious or common components (i.e., performance contingent and intrinsic rewards).

Pedhazur (1982) maintains that the total effect (DE + IE) between two variables should be considered when attempting ". . . to determine the expected change in an endogenous variable that is associated with a unit change in one of its causes. . ." (Pedhazur, 1982: 603). The effect coefficients (or total effect) for Model 3 are summarized in Table 5:

Table 5
Effects of Rewards and Performance on Satisfaction

Variable	Direct Effect	Indirect Effect	Total Effect
Performance Cont. Reward	.25	.015	.265
Intrinsic Reward	.41	.045	.455
Performance	.15	---	.15

Upon review of the effect coefficients from Table 5, it is apparent that intrinsic reward has the largest effect on job satisfaction. Additionally, performance contingent rewards have a moderate effect while performance has a weak but definite effect on job satisfaction.

Each of the proposed models in this research are examples of just-identified models. In each case, R has been

reproduced using the path analysis technique. Although R was reproduced in these models (generally considered to support causality), the validity of causal relationships in just-identified models can still be questioned. Researchers more often use over-identified models to test the validity of causal relationships by reproducing R. An over-identified model is one in which the model contains more information than is needed to estimate the path coefficients. A three variable over-identified model would contain three knowns (correlations among the variables), and only two unknowns (the path coefficients). Therefore, the researcher must exclude paths in over-identified models, with an inherent assumption that the direct effect of these paths equals zero (Pedhazur, 1982:597,598,605).

In Model 2, none of the direct effects were close enough to 0 to be assumed to have no effect. In Model 1, the direct effect of satisfaction on performance was .07. Conversely, in Model 3, the direct effect of performance contingent rewards on performance was .10. Although both of these coefficients are low enough to assume a value of zero, a researcher must first propose a model for testing rather than finding a model which fits a completed analysis. For this reason, over-identified models are not proposed nor tested in this research. Consequently, the hypotheses are assessed on the strength of the causal linkages connecting the models and the theoretical background and evidence upon which they are based.

Hypothesis Analysis

Hypothesis 1. Supply Personnel's job satisfaction and organizational commitment levels cause their performance, which is indicated by the quality of service they provide to the customer.

This hypothesis investigates the predictive power of job satisfaction and organizational commitment and their effects (both combined and individually) on performance. Model 1 was developed to examine the proposed relationships among the three variables. Job satisfaction was tested for both its direct effect on performance, and the role organizational commitment plays as a mediator between them.

Path analysis revealed the moderate total effect (.31) of satisfaction on performance. This was considered substantially large, particularly with the many volumes of research which dispute a causal relationship between satisfaction and performance (Iaffaldano and Muchinsky, 1985). What is particularly interesting is that only a small amount of this total effect is designated direct effect (.07). The large indirect effect (.31) is attributed to the path going from satisfaction through organizational commitment to performance. The effect coefficient (or total effect) should be used when attempting to determine the expected change in an endogenous variable associated with the expected change in one of its causes (Pedhazur, 1983:603). However, Hypothesis 1 proposed that satisfaction directly caused

performance. In reality, this research finding indicates that the satisfaction and performance relationship is almost always moderated by organizational commitment.

Further analysis reveals organizational commitment has a significant direct effect (.44) on performance, with only a small spurious effect (.05) due to common causes. Although commitment is confirmed to have a pronounced effect on performance, satisfaction alone does not cause performance. Thus, the null hypothesis for Hypothesis 1 can not be rejected because the direct effect of satisfaction on performance is so low it is assumed to be zero. In other words, statistical evidence from this research does not indicate that satisfaction causes performance. This conclusion coincides with Iaffaldano and Muchinsky (1985), and many other researchers who have been unable to validate the human relations theory that a satisfied employee is a better performer (see Chapter I).

Hypothesis 2. Supply Personnel's performance causes their job satisfaction and organizational commitment levels.

This line of reasoning follows Porter and Lawler's (1967): since satisfaction does not cause performance perhaps performance causes satisfaction (and commitment). Model 2 was developed to test this reversal of causal reasoning between satisfaction and performance. Performance was tested as a predictor of satisfaction and commitment and was tested in conjunction with satisfaction to determine their combined impact on commitment.

An evaluation of the causal linkages proposed in Model 2 was conducted using path analysis. Performance had a moderately strong total effect (.38) on satisfaction. Furthermore, a large total effect (.50) of performance on commitment was established. Of this total effect, a significant portion was the indirect effect (.22) of performance on commitment which was designated by the path going from performance through satisfaction to commitment. Finally, the large total effect (.57) of satisfaction on commitment was indicative of a strong causal relationship between these two constructs.

In light of the significant causal linkages obtained through path analysis for Model 2, the null hypothesis is rejected for Hypothesis 2. None of the paths contain coefficients low enough to be considered zero. Thus, significant statistical evidence found in this research supports Porter and Lawler (1967) who believed that performance causes satisfaction. Moreover, the evidence that performance causes organizational commitment supports Mowday and others (1979) who maintained that a positive relationship existed (although without directionality) between the two constructs.

Although Model 2 was validated, the high error residual coefficient ($e_1=.92$) associated with job satisfaction remains a concern. A residual error is defined as the amount of variability between X (independent variable) and Y (dependent variable) that is not explained or predicted by X

(Pedhazur, 1983:16). In this case, a high residual error indicates satisfaction was caused by many other variables in addition to performance. Identifying these other variables, and the importance of them, is an issue for future research.

Hypothesis 3. Rewards allocated to Supply Personnel cause performance, which causes job satisfaction.

To test this hypothesis, Model 3 was developed and tested. Performance was first regressed on performance contingent and intrinsic rewards. Then, satisfaction was regressed on performance and both of the reward variables. The model was not designed to analyze the correlation between performance contingent and intrinsic rewards. These variables were considered exogenous--one had no effect on the other.

The results of path analysis, used to test the relationships in Model 3, revealed the weak total effect (.10) performance contingent rewards had on performance. Intrinsic reward had a moderate (.30) total effect on performance. The residual error coefficient (.93) for performance was quite large. This provides further evidence that rewards do not by themselves predict performance. Rewards had a larger effect on satisfaction than they did on performance. Performance contingent rewards total effect (.26) on satisfaction was almost exclusively direct (.25). Intrinsic rewards strong total effect (.45) on satisfaction validates other research which found ". . . intrinsic task rewards are by far the most powerful predictor of overall work satisfaction

across all occupational groups" (Mottaz, 1985:375). Performance had only a weak total effect (.15) on satisfaction, and an even larger spurious effect (.18) due to common causes.

A weak link exists in Model 3 between performance contingent rewards and performance (direct effect = .10). Additionally, the coefficient between performance and satisfaction (direct effect = .15) is only slightly higher. Therefore, the null hypothesis can not be rejected: the path coefficients are low enough to be assumed equal to zero. Statistical evidence does not support the causal relationships formulated in Model 3. Although rewards are good predictors of satisfaction, their impact on performance is judged small. Moreover, the high residual error associated with performance means that many other important causes of performance exist. Finding these other predictors of performance is another issue for subsequent researchers to address.

Modified Model

In chapter 1, a model of work attitudes, rewards, and performance was developed to facilitate a basis for this research. Four different variables were proposed to effect performance with unknown directionality and causal relationships between those variables and performance. Following the path analysis procedure, conducted to address the three

hypotheses posed, this model is now modified using the results of this research (Figure 10).

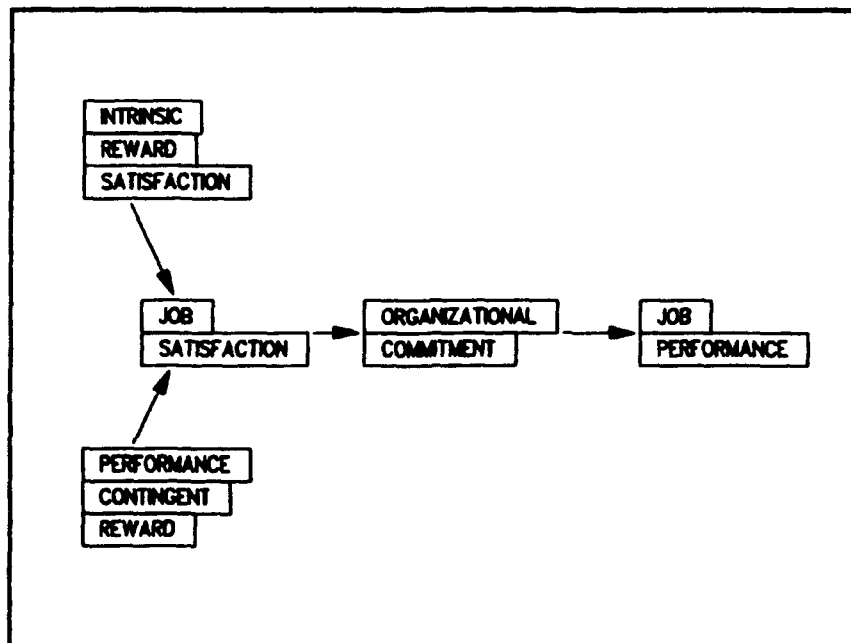


Figure 10. Revised model of the relationship between rewards, satisfaction, organizational commitment, and job performance.

Intrinsic and performance contingent rewards were found to have the largest total effect on satisfaction, while their effect on performance was weak to moderate (Model 3). Job satisfaction had a very strong total effect on organizational commitment (Model 2). This concurs with other researchers who have suggested that satisfaction is a short term work attitude that tends to have a positive effect on the long term attitude--commitment (Shore and Martin, 1989; Motaz, 1987). Organizational commitment had a strong total effect on job performance. Although limited research has

been conducted with regard to a causal relationship between commitment and performance, evidence does exist which clearly relates the two constructs (Mowday and others, 1979).

Although these relationships have been proposed separately in the literature (Mottaz, 1985; Mowday and others, 1979), this combined model is believed to be original. Therefore, this revised model is offered as a collective summary of these findings and is a foundation upon which to base subsequent research.

Summary

This chapter has provided the results of this research as outlined in Chapter II, Methodology. An analysis of the answers provided by this sample found support for one of the three hypotheses posed at the outset. Through path analysis, performance was found to be a good predictor of satisfaction and commitment. Conversely, satisfaction alone was determined not to cause performance. Rewards had a weak effect on performance but a moderately strong effect on job satisfaction. Organizational commitment was determined to be a strong predictor of performance. A revised model was offered which attempts to explain the causal relationships determined through these research findings. The next chapter draws conclusions and provides recommendations for management to benefit from this analysis.

IV. Conclusions and Recommendations

This research set out to determine which variables have the greatest impact on the service provided by Supply Personnel. Once these factors were identified, it was expected that specific recommendations could be offered to management in order to operationally enhance their organization. This chapter draws conclusions (both theoretical and practical) from the research, and provides recommendations which can lead to improvements in the performance of Supply employees, and thus the organization as a whole.

Theoretical Results

Path analysis was used in this research to test three causal hypotheses concerning work attitudes, rewards, and performance (Chapter III). It is important to note that the results of these analyses are not intended to demonstrate causality among the variables. Rather, the path procedure is intended to test a causal theory and whether ". . . the theory withstood the test; that it has not been disconfirmed" (Pedhazur, 1982:580).

The first causal theory tested, satisfaction (and commitment) causes performance, was not clearly supported by the path results. Apparently, satisfaction does not directly cause performance but does affect commitment, which in turn, affects performance.

Evidence supporting Lawler and Porter's (1967) theory, performance causes satisfaction (and commitment), was found in the analysis of Model 2. Although the path coefficients were not overly strong (ranging from .28-.57), they were sufficiently large to substantiate positive causal relationships among all paths.

The third causal theory tested, rewards cause performance and satisfaction, was disconfirmed because of the weak direct effect performance-contingent rewards had on performance. Rewards, both intrinsic and performance-contingent, had a much larger affect on satisfaction than performance.

Although these theoretical results do not substantiate causality, one can use them to generalize about relationships among the variables under consideration. These results imply that there are definite positive relationship among rewards, satisfaction, commitment and performance. Therefore, productive employees are likely more committed to the organization, more satisfied with their job, and feel justifiably rewarded for their efforts. Further, it is believed that the underlying processes may be reversed (i.e., starting with rewards, ending with performance). Managers who accept this interpretation can make improvements within their organization in any of these areas, with a reasonable hope of positively affecting the total process.

Implications for Supply Management

Initially, this research operated under Flores' assumptions that only specific sections of Supply are involved with the customer service function (Flores, 1990). However, subsequent analysis of the survey questions dealing with rewards and customer service found very little distinction among employees with respect to their assigned sections (Ch III). Moreover, the very nature of the word "supply" is indicative of providing either resources or materials to others. Therefore, all members of Supply seem to believe their job involves either providing these resources and materials, or supporting other members of their organization who do. Consequently, all employees in Supply seem to feel at least somewhat responsible for the customer service function (Appendix B, #41-#45). To this end, the remainder of these conclusions and recommendations refer to all members (unless otherwise stated) of the entire Supply Organization and not just a "customer service" sub-element.

Job Satisfaction. Combining responses from the questions designed to calculate job satisfaction levels, indicates that the mean general satisfaction score was 3.66 with a standard deviation 1.02. This value falls between response "C" (can not decide if satisfied with this aspect) and response "D" (are satisfied with this aspect of the job). An interpretation of the overall score is indicative of the fact that most employees in the sample are less than

completely satisfied with many aspects of their job. A possible explanation for this lack of satisfaction lies within the lowest and highest mean scores for the particular responses. Answers to the question that dealt with Air Force policies and their implementation (mean=3.05, SD=1.09) implies that the structure and policies of the organization (either the immediate unit or larger functional organization) does not cultivate satisfaction within the employees. Conversely, the highest mean score (most satisfaction) was found in the response to the statement "The chance to do things for other people," (mean=4.07, SD= .78). Thus, Supply employees genuinely want to help their customers but find that the policies which guide their actions are preventing them from adequately doing so. This research found the effect of satisfaction on performance is indirect through organizational commitment. Therefore, the restructuring of Supply policies and procedures (and the associated implementation process) is the necessary first step toward improved satisfaction, with an incremental effect on commitment. The eventual impact of these changes is highly likely to improve employee performance, as shown by an improvement in the quality of customer service.

Organizational Commitment. The combined mean commitment score for the seven point scale was 4.56. As in satisfaction, this score falls between the neutral or middle response "D" and response "E" or "Slightly Agree". However, a large combined commitment standard deviation of 1.77

between the respondents provides a better insight into this variable. Perhaps two dissimilar types of employees exist in Supply, as has been hypothesized in other organizations (Wright, 1990:380). The non-career employee (low commitment) identifies with the work group or social aspect of the job assignment. This individual performs best when a task-oriented leadership style is used and the group is given trust and confidence to complete the tasks at hand. On the other hand, the career employee (high commitment) identifies with the supervisor and organization. This individual expects promotion and desires feedback to ensure he/she is performing according to supervisor and organization expectations. Participative management and a relationship-oriented leadership style is most appropriate for the career employee (Wright, 1990:379).

For Supply, the task of assigning career and non-career employees can spell disaster or success for the organization. When possible, the career (or committed) employees should be assigned to those positions which require the greatest interaction with customers outside of the organization. The non-career employees should be assigned those positions which support the other customer--their peers within Supply. Thus, maximum performance can be derived from the non-careerists who strive to please the immediate work group, but have little regard for "outsiders". Meanwhile, the careerists perform well because they believe it is expected of them. Every effort to serve the organiza-

tion's customer is considered a challenge to excel. When possible, these employees will relax rigid policies and procedures to make them more conducive to customer service. Therefore, assuming Supply employees can be categorized (either through their intentions, actions or statements) according to their commitment orientation, management can assign each type differently so that performance of all assigned personnel is improved.

Reward Satisfaction. The highest mean score (6.4) on any response in this survey is in the area of intrinsic reward satisfaction. Almost all Supply employees agreed that they feel a sense of accomplishment when they are able to solve customer problems and concerns. Limited research in this area, found a positive relationship between intrinsic reward satisfaction and commitment (Mottaz, 1988:478). Management can increase opportunities for intrinsic rewards through job redesign (job enlargement and job enrichment). Job enlargement entails ". . . combining several related tasks and thus increasing skill variety and skill identity" (Daft and Steers, 1986:172). Of course, recent personnel cutbacks within Air Force organizations will naturally provide the trend toward job enlargement. However, job enrichment may be more difficult to implement. It involves making jobs more meaningful, interesting, and challenging (Mottaz, 1988:478). To the extent that management can successfully redesign jobs within the organization, greater intrinsic rewards will be available for Supply employees.

Because intrinsic rewards also have a positive influence on job satisfaction (Ch III), workers finding more opportunities for intrinsic rewards may become more satisfied and friendlier to their customers (Shore and Martin, 1989:634). The intrinsically rewarded employee is more satisfied, more committed, and a better performer. Such an employee provides better service to the customer, representing Supply as an organization that cares enough about its customers to care about its employees.

As found in other research, extrinsic rewards do not influence employee performance and attitudes to the extent intrinsic rewards do (Mottaz, 1988:478). Although most felt the organization did not have a good extrinsic reward system for compensating customer service effectiveness (mean=3.59; SD=1.89), this had only a minor impact on their performance. However, the quick conclusion that extrinsic rewards have no impact on performance may be erroneous. In the military, base-level organizations have very little control over extrinsic rewards. Enlisted promotion is determined largely through testing and quotas which are dictated by the larger (Air Force) organization. Therefore, some would suggest that employees do not believe their unit has the ability to increase pay through promotion; thus, eliminating a potential relationship between extrinsic rewards and performance.

Performance. Flores interpreted the results of her research and found that Supply employees were not performing according to customer expectations (Flores, 1990:71).

Conversely, this research indicates Supply employees rate their performance very high (combined mean score=5.96, SD=1.14). To some, it may seem strange to allow a sample to self-rate performance, and then use it as a true indication of employee performance. However, it is an acceptable practice in the social sciences and the standard deviation in this research indicates a considerable difference in rated performance across respondents. In fact, in one meta-analytical research study, the authors identified ten published studies which had used self-ratings as at least one indication of performance (Iaffaldano and Muchinsky, 1985: 256-261). Nevertheless, there remains a large disparity between Flores' findings on Supply performance and this research's conclusion. Actually, employee performance is probably not as bad as indicated by Supply customers (Flores' research), and not as good as indicated by self-ratings in this research, since some inflation in the ratings is to be expected. However, it is believed that relative performance levels are probably rather accurately indicated by the results of the self-ratings.

Finding those factors that have the greatest effect on performance is of primary importance to managers wishing to improve their organizations. Path analysis revealed that organizational commitment had the greatest direct effect (.44-Model 1) on performance, while all the other factors had less, but at least a small impact on performance. As previously mentioned, many factors are believed to affect

employee performance, and many of these factors are not captured in this research. Some of these other factors include, but are not limited to, supervisory leadership style, pressure for production, higher-order need strength, need for achievement, motivational type, and occupational group (Lopez, 1982:345). Future researchers examining performance within Supply organizations may want to combine these factors with those identified in this study in order to better analyze overall employee performance.

Since organizational commitment has the greatest effect on performance, management should make every attempt to increase commitment within the organization. Affective commitment (identification with and involvement in the organization) is often determined within the first few months of employment (Meyers and others, 1989:155). Therefore, researchers suggest early work experiences should be managed carefully to ensure every attempt is made to increase affective commitment. When a new employee enters a Supply position, management should strive to clarify responsibilities, be available for assistance, and align the goals and values of the individual with those of the organization. However, management must also realize that the employee's needs change with time. After affective commitment is instilled, and the employee functions comfortably for a period of time, the goal for management should be to keep the job interesting and challenging, or to move the employee into a more autonomous position. Ultimately, efforts to

improve commitment in the organization will lead to improved employee performance.

A final effort to improve employee performance could come in the area of scheduling. Companies that want to increase productivity and efficiency are allowing employees to have more of an input into their own work schedules. For example, the four day work week (ten hours per day) has become popular with employees since it allows for more leisure time. In fact, one survey found that companies using a four day work week ". . . generally met their objectives, whether they were to reduce costs, improve efficiency, reduce absenteeism, or improve job satisfaction" (Daft and Steers, 1986:176). Other non-traditional scheduling methods being initiated in organizations include flextime (employee latitude in setting starting and quitting times), and job rotation (minimizes boredom by rotating workers between boring or repetitive jobs) (Daft and Steers, 1986:177). Should these programs be initiated within Supply, their impact on performance should be positive with a direct impact on customer service.

Recommendations

This research set out to identify whether work attitudes and rewards have an influence on performance. To that end, there should be little debate that they do. Managers at all levels should use this knowledge to change their

organizations in response to employee needs and desires. The end result is hoped to be an improvement in Supply personnel performance, as indicated through customer service attitudes and efforts. With these objectives in mind and based on the findings in this research, the following recommendations are offered.

a. Instill a customer service orientation within Base Supply that is aimed at all employees - not just those assigned to traditional customer service positions. Employees clearly think that customer service is a critical part of the supply function, perhaps much more than had been thought by outsiders or even Supply managers. This will clarify the customer service role of all Supply personnel and their respective supervisors. Since employees in positions of less customer contact appear to feel responsible for customer service, making intrinsic rewards available for all employees whom successfully resolve customer problems and complaints should improve performance drastically in this area.

b. Supply policies and procedures can be reviewed to determine which ones are hampering customer service efforts. Research findings indicate that employees genuinely want to help the customer with problems but are often hindered by policies which may, or may not, be necessary for a "customer oriented" organization.

c. When possible, put the career (committed) employees, in the positions that require the greatest amount of

customer contact. Examples of these positions include: Customer Service Unit; Demand Processing; Equipment Management; Base Service Store; Individual Equipment Unit; and, Pick-Up and Delivery. An obvious example of the non-career employee (who should not be placed in the aforementioned positions) is the individual who has been denied re-enlistment, or is under investigation for disciplinary problems. This individual is not concerned with portraying his/her organization in a positive light and may purposely degrade relationships between Supply and other base organizations. New employees should not be thrust into high-contact customer service positions. Affective commitment between the individual and the organization may not yet have occurred resulting in less-than-optimum performance.

d. Management must continually strive to make jobs intrinsically rewarding for employees. Combining positions, giving employees greater latitude in determining their task responsibilities, and/or providing more autonomy to subordinates keeps the job interesting and challenging; thus offering increased opportunities for intrinsic rewards.

e. Orientation programs for new Supply personnel can be reviewed in order to ensure that the goals and values of the organization are properly introduced. Management must be aware that new employees need their guidance in order to become knowledgeable about their assigned tasks and comfortable with the overall work situation. To the extent that management can instill affective commitment in new employ-

ees, long term organizational commitment and performance will be positively influenced.

f. Mid-level management needs to be aware of the factors that influence the performance of their subordinates and how their actions can positively or negatively affect their unit's success. Training programs or management seminars will be a good forum for discussing employee needs and their own role in improving work attitudes and behaviors of their personnel.

g. When possible, employee preferences should be considered when developing work schedules. Organizations that have initiated four day work weeks, flextime, and job rotation programs have found them highly satisfying for the employees leading to increased efficiency and productivity for the organization (Daft and Steers, 1986:176).

Suggestions for Further Research

Often a particular study will present a need for more research. Based on the results of this research, the following recommendations for subsequent analysis are offered:

a. A revised model of the relationship between employee work attitudes, rewards, and performance was presented in Chapter III. However, many other factors are known to influence performance. Future researchers may want to combine other factors deemed relevant to performance and include these with the factors already identified in this

research. The results of the present study may be confirmed and the future researcher may further clarify the causal conditions of employee performance.

b. Additional research could be conducted in other Air Force Major Commands (MAJCOMS) in order to evaluate employee work attitudes and performance in their Supply function, allowing for a comparison between those results and the ones presented here.

c. This survey could also be modified for use with base level organizations other than Supply, such as Maintenance, Transportation, or Civil Engineering. Each of these other organizations also entail a type of customer service element which is not commonly recognized as such. The research would be beneficial for management in these organizations in order to determine the importance their employees place on delivering material and resources to other units which they support.

d. Future researchers may wish to use this survey instrument in an environment where extrinsic rewards are a salient part of the organization's reward system. A comparison could then be made between those results and the ones gathered in the present study to better determine the effect of extrinsic rewards on performance.

e. Since employee work attitudes, response to rewards, and performance can change from time to time, this survey should be conducted periodically to remain "in touch" with

Supply employees. It is believed to be a good forum for employee feedback which might not otherwise be heard.

Summary

This research identifies the important variables that influence employee performance. Management can expect those employees who are the most committed to the organization to perform best. Rewards (mainly intrinsic) were found to have the most impact on job satisfaction, which has a strong direct effect on commitment. Suggestions were offered to management which, if followed, should positively affect employee work attitudes and performance.

It must be recognized that this research was conducted during one point in time. The Persian Gulf War had just come to a successful ending. Men and women in uniform were considered heroes by the majority of Americans. Since job satisfaction is a transient or short term attitude, the survey might well be replicated periodically within Supply (or other organizations) to ensure that management remains adequately informed of employee attitudes, and how they influence performance.

It is hoped that TAC Supply will use the information in this thesis as a basis for continually examining the relationship between the organization, its employees, and its customers. Ultimately, customer service depends not only on the employee, but also on the organization, which either

detracts from or enhances a quality customer service environment.

These results also have implications for managers throughout the Air Force. Although some factors affecting performance may be unknown (or difficult to determine), work attitudes and rewards should be recognized as factors which influence performance. Thus, managers at all levels should attempt to make their employees' jobs interesting and challenging; being sensitive to them throughout their career development. Smart managers will make changes which respond to the needs of their employees, effectually improving their performance and thus, the organization.

Appendix A: Survey Notification from HQ TAC/LGS
To Supply Squadron Commanders



DEPARTMENT OF THE AIR FORCE

HEADQUARTERS TACTICAL AIR COMMAND
LANGLEY AIR FORCE BASE VA 23665-

REPLY TO
ATTN OF LGS

18 Mar 91

SUBJECT Survey of Supply Personnel Work Attitudes

to All TAC Supply Squadron Commanders

1. As part of his thesis effort, Capt Steve Eichenbrenner, a graduate student at the School of Systems and Logistics, Wright Patt AFB, OH has compiled a survey to examine work attitudes of supply employees. All enlisted members of your organization with a SSN ending in two should fill out the questionnaire. By surveying 10 percent of our total population, Capt Eichenbrenner can determine general job satisfaction, organizational commitment, perceived self-performance and reward satisfaction levels.

2. The intent of the survey is not to identify "good or bad" employees or organizations. Rather, Capt Eichenbrenner plans to identify if differences in satisfaction exist between various groups of employees assigned to particular positions. Of specific interest are personnel assigned to customer service areas. Of course, our goal remains to provide the best possible support and service to our customers. Research which provides insight into the work attitudes of our people indicates our ability to successfully accomplish this goal.

3. Your support for this survey is critical. Please ensure a reliable individual is appointed to disseminate the survey and ensure its completion. All participants will be assured anonymity by personally sealing their scan sheet in the envelope provided. Once the POC has all the sealed results, he should return them all in the large pre-addressed envelope provided. The POC should collect and return the surveys NLT two weeks from the receipt of this package.

4. Should you have any questions about this survey, feel free to contact Capt Eichenbrenner, DSN 795-8989.


VAN A. McCREA, Colonel, USAF
Director of Supply

Appendix B: Survey Instrument



DEPARTMENT OF THE AIR FORCE

HEADQUARTERS TACTICAL AIR COMMAND
LANGLEY AIR FORCE BASE VA 23065

REPLY TO
ATTN OF:

LGS

18 Mar 91

SUBJECT: Survey of Supply Personnel Work Attitudes

TO: Survey Participant

1. Please take the short amount of time necessary to complete the attached questionnaire and return it promptly to your squadron survey POC. A computer scan sheet is included and should be used to answer all questions. Upon completing the questionnaire, seal it with the computer scan sheet in the envelope provided, before returning it to the survey POC.

2. The survey measures the need for work improvements to TAC Supply Organizations. By completing this survey, you help us determine if basic changes in policies or procedures are necessary to make your organization more responsive to your needs. The data will be sent to a graduate student at the Air Force Institute of Technology (AFIT) for an objective analysis.

3. You have been carefully selected to represent the opinions of many others like you. Your participation is essential for that opinion to be properly represented.

4. You can be assured that all responses are completely anonymous. All data is combined, to get a summary opinion of work attitudes within TAC Supply Organizations. Please contact Capt Steve Eichenbrenner, DSN 785-8989, should you have any questions concerning this survey.


VAN A. McCREA, Colonel, USAF
Director of Supply

1 Atch
Questionnaire

Survey of Supply Personnel Work Attitudes

I. Background Information. This part of the questionnaire is designed to collect general information about the respondent group. Please read each item carefully, then answer using the computer scan sheet provided. Fill in the circle completely with a #2 pencil for the item that most accurately describes your present situation. Please respond candidly to all questions.

1. What is your pay grade?
 A. E1 D. E4 G. E7 J. Other
 B. E2 E. E5 H. E8
 C. E3 F. E6 I. E9
2. How long have you been in the Air Force?
 A. Less than one year D. 11 - 15 years
 B. 1 - 5 years E. 16 - 20 years
 C. 6 - 10 years F. 21 or more years
3. To which base are you currently assigned?
 A. Bergstrom AFB K. Moody AFB
 B. Cannon AFB L. Mountain Home AFB
 C. Davis-Monthan AFB M. Myrtle Beach AFB
 D. England AFB N. Nellis AFB
 E. George AFB O. Seymour Johnson AFB
 F. Holloman AFB P. Shaw AFB
 G. Homestead AFB Q. Tonopah Test Range
 H. Langley AFB R. Tyndall AFB
 I. Luke AFB S. Other (write in below)
 J. MacDill AFB
4. Indicate the section to which you are primarily assigned.
 (Choose only one)
 A. Customer Service Unit F. Base Service Store
 B. Demand Processing G. Shop Service Center
 C. Stock Control H. AGS Parts Store
 D. Equipment Management I. Material Control
 E. MICAP J. Other (specify)
5. How long have you been assigned to your current section?
 A. less than one year C. 2 - 3 years
 B. 1 - 2 years D. 4 or more years

II. Job Satisfaction. This part of the questionnaire is designed to collect information on general job satisfaction levels. Continue to fill in your answers on the computer scan sheet. Your answers should correspond to the letter next to the rating scale below. Again, please consider each question carefully, then indicate your true feelings.

- A. Means you are very dissatisfied with this aspect of your job.
- B. Means you are dissatisfied with this aspect.
- C. Means you can't decide if you are satisfied or not with this aspect of your job.
- D. Means you are satisfied with this aspect.
- E. Means you are very satisfied with this aspect of your job.

6. Being able to keep busy all the time.
7. The chance to work alone on the job.
8. The chance to do different things from time to time.
9. The chance to be somebody in the community.
10. The way my boss handles his/her personnel.
11. The competence of my supervisor when he/she makes decisions.
12. Being able to do things that don't go against my conscience.
13. The way my job provides for steady employment.
14. The chance to do things for other people.
15. The chance to tell people what to do.
16. The chance to do something that makes use of my abilities.
17. The way Air Force policies are put into practice.
18. My pay and the amount of work I do.
19. The chances for advancement on the job.
20. The freedom to use my own judgement.
21. The chance to try my own methods of doing the job.
22. The working conditions.
23. The way my co-workers get along with one another.
24. The praise I get for doing a good job.
25. The feeling of accomplishment I get from the job.
26. Enjoying the work itself.

III. Organizational Commitment. This part of the questionnaire is designed to collect general information on how the respondents feel about their organization. Continue to fill in your answers on the computer scan sheet. Use the rating scale below to indicate your true feelings through your thoughtful answers to all questions.

Strongly	Moderately	Slightly	Neutral	Slightly	Moderately	Strongly
Disagree	Disagree	Disagree		Agree	Agree	Agree
A	B	C	D	E	F	G

27. I am willing to put in a great deal of effort beyond that normally expected in order to help this organization be successful.
28. I talk up this organization to my friends as a organization to work for.
29. I would accept almost any type job assignment in order to keep working for this organization.
30. I find that my values and the organization's values are very similar.
31. I am proud to tell others that I am a part of this organization.
32. This organization really inspires the very best in me in the way of job experience.
33. I am extremely glad that I chose this organization to work for, over others I was considering at the time I joined.
34. I really care about the fate of this organization.
35. For me, this is the best of all possible organizations for which to work.

(Please go on to next page)

IV. Perceived Self Performance Measure. The following statements and questions deal with your view of your own performance. Your frame of reference should be your performance over the past six months or so in light of what is expected of you. Please think carefully of the various things you produce (major responsibilities or your assigned job) in the way of services and or products as you respond to these questions or statements. Use the following scale to indicate on the scan sheet, the extent to which you agree or disagree with the statements shown below.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
A	B	C	D	E	F	G

- 36. The quantity of your output is very high.
- 37. The quality of your output is very high.
- 38. You always get maximum output from the available resources (e.g. money, material, personnel).
- 39. You do an excellent job anticipating problems that may come up and either preventing them from occurring or minimizing their effects.
- 40. When high priority work arises (e.g. "crash projects" or sudden schedule changes) you do an excellent job in handling and adapting to these situations.

V. Reward Satisfaction. This part of the questionnaire is designed to collect information on your satisfaction with the rewards you receive for your [E] efforts on the job. Continue to use the scan sheet & scale provided.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral non-applic	Slightly Agree	Moderately Agree	Strongly Agree
A	B	C	D	E	F	G

- 41.) I feel a sense of accomplishment when I'm able to solve customer problems and concerns.
- 42.) I am appreciated by my supervisors when I make an extra effort to solve customer problems and concerns.
- 43.) One promotion criteria upon which I am judged, is my ability to solve customer problems and concerns.
- 44.) My organization has constructed a good reward system for compensating my efforts to solve customer problems and concerns.
- 45.) The better I am able to solve customer problems and concerns, the sooner I'll get recognized and rewarded for my efforts.

Thank you for taking time to complete this questionnaire. At this time, please seal and put both the computer scan sheet and the survey package into the envelope provided. Please give the sealed envelope to your squadron survey point of contact, who originally gave you this questionnaire. Thanks again for your help!

**Appendix C: Supply Population and Sample
Demographic Characteristics**

BASE	E1-E3	E4	E5	E6	E7	E8	E9
<hr/>							
Bergs	91	76	67	18	19	3	2
Cannon	94	84	64	26	16	4	1
Dav-Mon	76	74	63	22	17	3	2
England	57	53	61	18	13	3	1
George	84	91	68	29	14	4	3
Hollman	87	107	81	33	15	7	3
Homestd	71	81	67	26	15	2	3
Langley	92	84	63	34	23	4	3
Luke	87	92	61	25	19	4	3
MacDill	79	85	59	21	17	3	2
Moody	68	67	54	18	16	2	1
Mtn Home	75	77	63	30	12	4	2
Mrtl Bch	69	69	50	23	14	4	1
Nellis	113	86	69	26	18	7	3
Sey Jnsn	94	86	74	24	17	4	2
Shaw	86	90	73	23	17	3	2
Tyndall	69	61	44	17	14	4	1
Tonopah	58	83	54	35	12	5	2
<hr/>							
Total	1450	1446	1135	448	288	70	37
% Tot	29.7%	29.7%	23.3%	9.2%	5.9%	1.4%	.8%
Sample	59	106	75	34	21	8	---
% Sam	19.5%	35.0%	24.8%	11.2%	6.9%	2.6%	.0%

Appendix D: Reliability Analysis

		MEAN	STD DEV	CASES
1.	JSAT1	3.8419	.9835	291.8
2.	JSAT2	3.9458	.8811	291.8
3.	JSAT3	3.6667	1.1666	291.8
4.	JSAT4	3.4536	1.8893	291.8
5.	JSAT5	3.7354	1.1878	291.8
6.	JSAT6	3.8935	1.8695	291.8
7.	JSAT7	3.9863	.9576	291.8
8.	JSAT8	4.8286	.9718	291.8
9.	JSAT9	4.8756	.7886	291.8
10.	JSAT10	3.5784	.8775	291.8
11.	JSAT11	3.7766	1.1818	291.8
12.	JSAT12	3.8515	1.8958	291.8
13.	JSAT13	3.8412	1.2198	291.8
14.	JSAT14	3.1924	1.1525	291.8
15.	JSAT15	3.6987	1.1882	291.8
16.	JSAT16	3.7354	1.8515	291.8
17.	JSAT17	3.7285	1.8398	291.8
18.	JSAT18	3.9458	.9597	291.8
19.	JSAT19	3.3482	1.2583	291.8
20.	JSAT20	3.7698	1.1531	291.8
21.	JSAT21	3.6873	1.1694	291.8

	SCALE MEAN IF ITEM DELETED	SCALE VARIANCE IF ITEM DELETED	CORRECTED ITEM- TOTAL CORRELATION	ALPHA IF ITEM DELETED
JSAT1	73.3858	167.8861	.3654	.9875
JSAT2	73.2827	169.1277	.3173	.9884
JSAT3	73.4811	158.8919	.5754	.9838
JSAT4	73.6942	163.4861	.4518	.9868
JSAT5	73.4124	159.6156	.5384	.9839
JSAT6	73.2543	163.8592	.4749	.9854
JSAT7	73.1615	164.6324	.4731	.9853
JSAT8	73.1271	164.5596	.4681	.9854
JSAT9	73.8722	163.9155	.6259	.9828
JSAT10	73.5773	166.2184	.4586	.9858
JSAT11	73.3711	156.7514	.6435	.9811
JSAT12	74.8962	161.6597	.5137	.9845
JSAT13	74.1865	162.7587	.4156	.9873
JSAT14	73.9553	157.5681	.6328	.9815
JSAT15	72.4578	156.8876	.6896	.9881
JSAT16	73.4124	159.4156	.6272	.9818
JSAT17	73.4192	159.7968	.6199	.9828
JSAT18	73.2827	165.6836	.4312	.9862
JSAT19	73.8876	155.5498	.6433	.9811
JSAT20	73.3788	156.7394	.6617	.9887
JSAT21	73.4685	156.4148	.6638	.9886

RELIABILITY COEFFICIENTS

N OF CASES = 291.8

N OF ITEMS = 21

ALPHA = .9888

		MEAN	STD DEV	CASES
1.	OC1	5.8771	1.3814	381.8
2.	OC2	4.4485	1.7967	381.8
3.	OC3	3.7176	1.9279	381.8
4.	OC4	4.1661	1.8288	381.8
5.	OC5	5.8833	1.7521	381.8
6.	OC6	4.4618	1.8137	381.8
7.	OC7	4.8664	1.9516	381.8
8.	OC8	5.2998	1.5949	381.8
9.	OC9	4.8731	1.9718	381.8

	SCALE MEAN IF ITEM DELETED	SCALE VARIANCE IF ITEM DELETED	CORRECTED ITEM- TOTAL CORRELATION	ALPHA IF ITEM DELETED
OC1	35.2359	142.9142	.6823	.9281
OC2	36.6645	129.4978	.7823	.9175
OC3	37.3953	138.8465	.6836	.9241
OC4	36.9468	131.8785	.7278	.9289
OC5	36.1896	127.8246	.8536	.9131
OC6	36.6512	129.5946	.7788	.9182
OC7	37.8465	127.2112	.7653	.9187
OC8	35.8148	136.5319	.6879	.9234
OC9	37.8399	126.2717	.7798	.9177

RELIABILITY COEFFICIENTS

N OF CASES = 381.8

N OF ITEMS = 9

ALPHA = .9285

		MEAN	STD DEV	CASES
1.	PERFORM1	5.9565	1.2157	299.8
2.	PERFORM2	6.2843	.9427	299.8
3.	PERFORM3	5.5485	1.3668	299.8
4.	PERFORM4	5.8361	1.1513	299.8
5.	PERFORM5	6.2174	1.8851	299.8

	SCALE MEAN IF ITEM DELETED	SCALE VARIANCE IF ITEM DELETED	CORRECTED ITEM- TOTAL CORRELATION	ALPHA IF ITEM DELETED
PERFORM1	23.8863	13.2885	.6255	.8826
PERFORM2	23.5585	14.3414	.6979	.7898
PERFORM3	24.2943	12.9864	.5544	.8383
PERFORM4	24.8867	13.1879	.6817	.7864
PERFORM5	23.6254	13.7317	.6596	.7937

RELIABILITY COEFFICIENTS

N OF CASES = 299.8

N OF ITEMS = 5

ALPHA = .8335

		MEAN	STD DEV	CASES
1.	RSATINT1	6.4887	.9388	292.8
2.	RSATINT2	5.2877	1.6783	292.8
3.	RSATPC1	4.5582	1.7992	292.8
4.	RSATPC2	3.5993	1.8986	292.8
5.	RSATPC3	3.8664	1.9529	292.8

	SCALE MEAN IF ITEM DELETED	SCALE VARIANCE IF ITEM DELETED	CORRECTED ITEM- TOTAL CORRELATION	ALPHA IF ITEM DELETED
RSATINT1	17.3116	34.9438	.2864	.8215
RSATINT2	18.4247	25.4135	.5866	.7384
RSATPC1	19.1541	24.8731	.5556	.7413
RSATPC2	28.1138	21.8688	.7154	.6883
RSATPC3	19.8459	21.4366	.7896	.6823

RELIABILITY COEFFICIENTS

N OF CASES = 292.8

N OF ITEMS = 5

ALPHA = .7812

Appendix E: Pearson Correlation Coefficients

PEARSON CORRELATION COEFFICIENTS							
	SAT	OCOMM	PERFORM	REVSAT	CONTING	GRADE	TIS
SAT	1.0000 (.291) P = .	.6885 (.298) P = .000	.3830 (.289) P = .000	.5931 (.289) P = .000	.4991 (.282) P = .000	.1365 (.291) P = .010	.1414 (.291) P = .000
OCOMM	.6885 (.298) P = .000	1.0000 (.301) P = .	.5015 (.298) P = .000	.5039 (.297) P = .000	.5232 (.291) P = .000	.1179 (.300) P = .021	.1180 (.301) P = .020
PERFORM	.3830 (.289) P = .000	.5015 (.298) P = .000	1.0000 (.299) P = .	.3631 (.298) P = .000	.2449 (.291) P = .000	.2371 (.298) P = .000	.2283 (.299) P = .000
REVSAT	.5931 (.289) P = .000	.5039 (.297) P = .000	.3631 (.298) P = .000	1.0000 (.300) P = .	.4866 (.292) P = .000	.1047 (.300) P = .035	.1000 (.300) P = .042
CONTING	.4991 (.282) P = .000	.5232 (.291) P = .000	.2449 (.291) P = .000	.4866 (.292) P = .000	1.0000 (.294) P = .	.0130 (.293) P = .412	.0084 (.294) P = .443
GRADE	.1365 (.291) P = .010	.1179 (.300) P = .021	.2371 (.298) P = .000	.1047 (.300) P = .035	.1000 (.300) P = .042	1.0000 (.304) P = .	.0763 (.304) P = .000
TIS	.1414 (.291) P = .000	.1180 (.301) P = .020	.2283 (.299) P = .000	.1000 (.300) P = .042	.0084 (.294) P = .443	.0763 (.304) P = .000	1.0000 (.305) P = .
SECTIME	.0310 (.290) P = .299	.0368 (.300) P = .263	.0870 (.290) P = .067	.0340 (.299) P = .279	.0210 (.293) P = .360	.0852 (.303) P = .069	1.0000 (.304) P = .

Appendix F: T-Test Results

VARIABLE		NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.
SAT	GROUP 1	123	78.3889	12.312	1.118	1.29	.139
	GROUP 2	168	76.2976	13.972	1.878		
OCOMM	GROUP 1	138	41.9846	12.467	1.893	1.18	.553
	GROUP 2	171	48.4583	13.184	1.882		
PERFORM	GROUP 1	129	29.8862	4.654	8.418	1.13	.478
	GROUP 2	178	29.8786	4.386	8.336		
REVSAT	GROUP 1	128	11.9688	2.884	8.177	1.26	.162
	GROUP 2	172	11.4382	2.253	8.172		
CONTING	GROUP 1	128	12.1953	4.894	8.433	1.82	.889
	GROUP 2	166	11.7892	4.848	8.376		

VARIABLE		* POOLED VARIANCE ESTIMATE *			* SEPARATE VARIANCE ESTIMATE *		
		T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
SAT	GROUP 1	1.27	289	.283	1.38	279.19	.195
	GROUP 2						
OCOMM	GROUP 1	1.83	299	.385	1.83	284.43	.382
	GROUP 2						
PERFORM	GROUP 1	-8.12	297	.983	-8.12	266.87	.983
	GROUP 2						
REVSAT	GROUP 1	2.15	298	.833	2.18	288.65	.838
	GROUP 2						
CONTING	GROUP 1	8.71	292	.848	8.71	271.88	.8479
	GROUP 2						

Appendix G: Hierarchical Multiple Regression Model
(Performance Dependent Variable)

Equation Number 1 Dependent Variable.. PERFORM

Beginning Block Number 1. Method: Enter SECTION GRADE

Variable(s) Entered on Step Number	1..	GRADE
	2..	SECTION

Multiple R	.22613	R Square Change	.05114
R Square	.05114	F Change	7.46394
Adjusted R Square	.04428	Signif F Change	.0007
Standard Error	4.41886		

----- Variables in the Equation -----

Variable	B	SE B	Beta	F	Sig F
GRADE	.784226	.187458	.228185	14.113	.0002
SECTION	-.181582	.094536	-.062956	1.155	.2835
(Constant)	27.372583	1.143888		572.617	.0000

Analysis of Variance			
	DF	Sum of Squares	Mean Square
Regression	2	291.48631	145.74316
Residual	277	5488.78511	19.52638

F = 7.46394 Signif F = .0007

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	F	Sig F
SAT	.342525	.348866	.979814	38.847	.0000
OCOMM	.467023	.474257	.978498	88.092	.0000
REWSAT	.337566	.341754	.972555	36.499	.0000
CONTING	.258832	.257225	.996742	19.555	.0000

Equation Number 1 Dependent Variable.. PERFORM

Beginning Block Number 2. Method: Forward SAT OCOMM
REWSAT CONTING

Variable(s) Entered on Step Number 3.. OCOMM

Multiple R	.51435	R Square Change	.21342
R Square	.26455	F Change	88.89224
Adjusted R Square	.25656	Signif F Change	.0000
Standard Error	3.89734		

----- Variables in the Equation -----

Variable	B	SE B	Beta	F	Sig F
GRADE	.565983	.166054	.176898	11.617	.0008
SECTION	-.012562	.083970	-.007785	.022	.8812
OCOMM	.163253	.081242	.467023	80.092	.0000
(Constant)	20.614074	1.260223		267.567	.0000

Analysis of Variance			
	DF	Sum of Squares	Mean Square
Regression	3	1588.82984	529.60995
Residual	276	4192.24159	15.18928

F = 33.89417 Signif F = .0000

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	F	Sig F
SAT	.849939	.842488	.531632	.497	.4813
REWSAT	.144132	.144988	.743388	5.898	.0158
CONTING	.886753	.886661	.781654	.812	.9121

Variable(s) Entered on Step Number 4.. REWSAT

Multiple R	.52915	R Square Change	.81544
R Square	.28000	F Change	5.89838
Adjusted R Square	.26952	Signif F Change	.0158
Standard Error	3.86321		

----- Variables in the Equation -----

Variable	B	SE B	Beta	F	Sig F
GRADE	.538189	.164997	.168211	18.639	.0012
SECTION	.885878	.883551	.883147	.884	.9516
OCOMM	.138878	.828682	.397269	45.884	.0000
REWSAT	.299623	.123378	.144132	5.898	.0158
(Constant)	18.899282	1.622546		124.431	.0000

Analysis of Variance			
	DF	Sum of Squares	Mean Square
Regression	4	1596.85959	399.21490
Residual	275	4184.21184	14.92441

F = 26.73573 Signif F = .0000

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	F	Sig F
SAT	-.821184	-.816651	.448223	.876	.7838
CONTING	-.842392	-.848215	.635616	.444	.5858

Appendix H: Hierarchal Multiple Regression Model
(Job Satisfaction Dependent Variable)

Equation Number 1 Dependent Variable.. SAT

Beginning Block Number 1. Method: Enter SECTION GRADE

Variable(s) Entered on Step Number	1..	SECTION
	2..	GRADE

Multiple R	.14288	R Square Change	.02819
R Square	.02819	F Change	2.85331
Adjusted R Square	.01311	Signif F Change	.0593
Standard Error	13.18855		

----- Variables in the Equation -----

Variable	B	SE B	Beta	F	Sig F
SECTION	-.378888	.282154	-.078245	1.727	.1899
GRADE	1.148738	.559487	.122242	4.216	.0418
(Constant)	74.911815	3.414856		481.449	.0000

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	992.59887	496.29944
Residual	277	48188.79835	173.93799

F = 2.85331 Signif F = .8593

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	F	Sig F
PERFORM	.353697	.348866	.948864	38.847	.0000
OCOMM	.676239	.675782	.978498	231.989	.0000
REWSAT	.586483	.584227	.972555	143.821	.0000
CONTING	.496837	.508581	.996742	92.286	.0000

Equation Number 1 Dependent Variable.. SAT

Beginning Block Number 2. Method: Forward

Variable(s) Entered on Step Number 3.. OCOMM

Multiple R	.68385	R Square Change	.44746
R Square	.46765	F Change	231.98888
Adjusted R Square	.46186	Signif F Change	.0000
Standard Error	9.73898		

----- Variables in the Equation -----

Variable	B	SE B	Beta	F	Sig F
SECTION	.007778	.209830	.001641	.001	.9705
GRADE	.568803	.414945	.059678	1.827	.1776
OCOMM	.694292	.045584	.676239	231.989	.0000
(Constant)	46.168118	3.149116		214.935	.0000

Analysis of Variance			
	DF	Sum of Squares	Mean Square
Regression	3	22995.85881	7665.28334
Residual	276	26177.54642	94.84618

F = 88.81885 Signif F = .0000

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	F	Sig F
PERFORM	.036148	.042488	.735446	.497	.4813
REWSAT	.336409	.397533	.743388	51.616	.0000
CONTING	.195027	.226105	.701654	14.816	.0001

Variable(s) Entered on Step Number 4.. REWSAT

Multiple R	.74282	R Square Change	.08413
R Square	.55178	F Change	51.61603
Adjusted R Square	.54526	Signif F Change	.0000
Standard Error	8.95253		

----- Variables in the Equation -----

Variable	B	SE B	Beta	F	Sig F
SECTION	.128708	.193620	.027159	.442	.5068
GRADE	.370269	.382361	.039402	.938	.3337
OCOMM	.527139	.047929	.513432	120.965	.0000
REWSAT	2.053990	.285895	.336409	51.616	.0000
(Constant)	28.928592	3.760056		59.192	.0000

Analysis of Variance			
	DF	Sum of Squares	Mean Square
Regression	4	27132.75984	6783.18996
Residual	275	22040.63659	80.14777

F = 84.63355 Signif F = .0000

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	F	Sig F
PERFORM	-.013138	-.016651	.642573	.076	.7830
CONTING	.099013	.119049	.635616	3.939	.0482

Variable(s) Entered on Step Number 5.. CONTING

Multiple R	.74708	R Square Change	.00635
R Square	.55813	F Change	3.93915
Adjusted R Square	.55007	Signif F Change	.0452
Standard Error	8.90507		

----- Variables in the Equation -----

Variable	B	SE B	Beta	F	Sig F
SECTION	.102358	.193051	.021599	.281	.5964
GRADE	.464932	.383313	.049476	1.471	.2262
OCOMM	.487366	.051715	.474694	88.813	.0000
REWSAT	1.871743	.298836	.306560	39.231	.0000
CONTING	.274673	.138393	.099013	3.939	.0482
(Constant)	29.158347	3.741913		60.721	.0000

Analysis of Variance			
	DF	Sum of Squares	Mean Square
Regression	5	27445.13508	5489.02702
Residual	274	21728.26135	79.30022

F = 69.21830 Signif F = .0000

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	F	Sig F
PERFORM	-.009376	-.011959	.552015	.039	.8435

Appendix I: Hierarchal Multiple Regression Model
(Organizational Commitment Dependent)

Equation Number 1	Dependent Variable..	OCOMM
Beginning Block Number 1.	Method: Enter	SECTION GRADE
Variable(s) Entered on Step Number 1..		SECTION GRADE
2..		GRADE

Multiple R	.14666	R Square Change	.02151
R Square	.02151	F Change	3.04460
Adjusted R Square	.01444	Signif F Change	.0492
Standard Error	12.83694		

----- Variables in the Equation -----

Variable	B	SE B	Beta	F	Sig F
SECTION	-.545285	.274631	-.118133	3.942	.0481
GRADE	.846801	.544571	.092518	2.418	.1211
(Constant)	41.398869	3.323036		155.205	.0000

Analysis of Variance			
	DF	Sum of Squares	Mean Square
Regression	2	1883.42874	581.71837
Residual	277	45646.88426	164.78782

F = 3.84468 Signif F = .8492

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	F	Sig F
PERFORM	.481604	.474257	.948864	88.092	.0000
SAT	.675325	.675782	.979814	231.989	.0000
REWSAT	.486909	.485430	.972555	85.087	.0000
CONTING	.526719	.531904	.996742	108.895	.0000

Equation Number	1	Dependent Variable..	OCOMM		
Beginning Block Number	2.	Method:	Forward	PERFORM	SAT
				REVSAT	CONTING

Variable(s) Entered on Step Number 3.. SAT

Multiple R	.68437	R Square Change	.44686
R Square	.46837	F Change	231.98880
Adjusted R Square	.46259	Signif F Change	.00000
Standard Error	9.47926		

----- Variables in the Equation -----

Variable	B	SE B	Beta	F	Sig F
SECTION	-.381388	.283429	-.865292	2.195	.1396
GRADE	.891286	.485179	.889965	.851	.8221
SAT	.657765	.843185	.675325	231.989	.8800
(Constant)	-7.874982	4.868421		3.761	.8535

Analysis of Variance			Sum of Squares	Mean Square
	DF			
Regression	3	21849.88855	7283.29285	
Residual	276	24888.34445	89.85632	

F = 81.85191 Signif F = .0000

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	F	Sig F
PERFORM	.276286	.345929	.833918	37.382	.0000
REWSAT	.137997	.151481	.648682	6.458	.0116
CONTING	.255842	.383431	.734291	27.887	.0000

Variable(s) Entered on Step Number 4.. PERFORM

Multiple R	.72937	R Square Change	.86362
R Square	.53199	F Change	37.38169
Adjusted R Square	.52518	Signif F Change	.0000
Standard Error	8.91817		

----- Variables in the Equation -----

Variable	B	SE B	Beta	F	Sig F
SECTION	-.255284	.191365	-.855386	1.788	.1833
GRADE	-.359384	.387919	-.839265	.858	.3558
SAT	.565618	.843388	.588718	178.633	.0000
PERFORM	.798148	.129235	.276286	37.382	.0000
(Constant)	-22.688513	4.513846		25.878	.0000

Analysis of Variance			Sum of Squares	Mean Square
	DF			
Regression	4	24816.85594	6204.21399	
Residual	275	21832.56986	79.39116	

F = 78.14742 Signif F = .0000

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	F	Sig F
REWSAT	.883432	.895982	.619483	2.548	.1116
CONTING	.228484	.287281	.683828	24.633	.0000

Variable(s) Entered on Step Number 5.. CONTING

Multiple R	.75537	R Square Change	.83868
R Square	.57859	F Change	24.63256
Adjusted R Square	.56275	Signif F Change	.0000
Standard Error	8.55835		

----- Variables in the Equation -----

Variable	B	SE B	Beta	F	Sig F
SECTION	-.268845	.183657	-.858244	2.143	.1444
GRADE	-.123388	.375279	-.813481	.188	.7426
SAT	.468615	.846628	.472911	97.585	.0000
PERFORM	.726875	.124669	.254888	33.994	.0000
CONTING	.617141	.124345	.228484	24.633	.0000
(Constant)	-21.882295	4.342758		23.389	.0000

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	5	26617.78485	5323.54897
Residual	274	28831.72815	73.18847

F = 72.81782 Signif F = .0000

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	F	Sig F
REWSAT	.819311	.822382	.568237	.137	.7117

Appendix J: Multiple Regression - Performance Regressed on Rewards

Equation Number 1 Dependent Variable.. PERFORM

Beginning Block Number 1. Method: Enter REWSAT CONTING

Variable(s) Entered on Step Number	1..	CONTING
	2..	REWSAT

Multiple R	.36509		
R Square	.13329	R Square Change	.13329
Adjusted R Square	.12725	F Change	22.06877
Standard Error	4.18419	Signif F Change	.00000

----- Variables in the Equation -----

Variable	B	SE B	Beta	F	Sig F
CONTING	.093869	.058664	.100593	2.560	.1107
REWSAT	.632191	.130100	.305486	23.613	.0000
(Constant)	21.305651	1.352696		248.078	.0000

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	772.73664	386.36832
Residual	287	5824.64267	17.50747

F = 22.86877 Signif F = .0000

**Appendix K: Multiple Regression - Satisfaction
Regressed on Performance and Rewards**

Equation Number 1 Dependent Variable.. SAT

Beginning Block Number 1. Method: Enter PERFORM REWSAT
CONTING

Variable(s) Entered on Step Number	1..	CONTING
	2..	PERFORM
	3..	REWSAT

Multiple R	.65529		
R Square	.42941	R Square Change	.42941
Adjusted R Square	.42323	F Change	69.48699
Standard Error	10.87868	Signif F Change	.00000

----- Variables in the Equation -----

Variable	B	SE B	Beta	F	Sig F
CONTING	.713214	.144062	.257116	24.510	.0000
PERFORM	.456436	.143368	.155449	10.136	.0016
REWSAT	2.526350	.329330	.413791	58.847	.0000
(Constant)	25.531528	4.470785		32.613	.0000

Analysis of Variance			
	DF	Sum of Squares	Mean Square
Regression	3	21141.47312	7047.15771
Residual	277	28092.49129	101.41694
F =	69.48699	Signif F =	.00000

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Vita

Captain Stephen J. Eichenbrenner was born on 17 Nov, 1957 in Newport News, VA. He graduated from Hampton High School in 1976 and immediately entered undergraduate studies at Old Dominion University in Norfolk, VA. He graduated in 1980 with a Bachelor of Science in Business Administration. He subsequently enlisted in the Air Force in 1981, beginning his career as an Aircraft Electrical Systems Specialist. In 1984, he was selected for Officer Training School, graduating as a "Distinguished Graduate" in 1985. He next attended Munitions Officer School, Lowry AFB, CO. Following completion of basic munitions training, he was accepted into the Naval Ordnance School, Indian Head, MD for Explosive Ordnance Disposal (EOD) training. In 1986, he was assigned to the 56 TAC Training Wing, MacDill AFB, FL. There he managed the EOD unit which was responsible for responding to any and all explosive related incidents, both on base and at Avon Park Air Force Bombing Range, Avon Park, FL. In May 1990, he was accepted into the School of Systems and Logistics, Air Force Institute of Technology.

Permanent Address: 5612 Carmel Station Av.
Charlotte, NC 28105

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13. ABSTRACT (Maximum 200 words) The purpose of this study was to evaluate the effect of work attitudes and rewards on the performance of TAC base level Supply personnel. The research used a survey instrument to examine a cross section of all enlisted employees assigned to various positions within TAC Supply. The research had four objectives: 1) test three causal hypotheses through path analysis; 2) determine if individuals functioning in customer service positions are significantly different than those not supporting customers; 3) identify opportunities available to Supply managers for improving their organizations; and 4) provide a benchmark for future work attitude evaluations. Path analysis revealed support for performance as a predictor of satisfaction and commitment, but not vice-versa. Rewards were not found to have much of an effect on performance, but were found to affect satisfaction. Organizational commitment was found to have the greatest influence on performance. The only difference between the two groups of employees lied within their response to intrinsic reward satisfaction for customer service efforts. Recommendations were subsequently offered to Supply managers and suggestions for future research were given.			
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